



ZHEJIANG ZHONGQIAO ELECTRICAL CO.,LTD

Address: Address: Xiangyang Industrial Zone, Liushi Town, Yueqing
City, Zhejiang Province

Tel: 0577-6262 7972

Fax: 0577-6262 7971

Website: www.cnzq.com.cn

Mailbox: wxzcnzq@163.com

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- * Our company reserves the right to make changes for the technical progress and upgrading of our products, and any changes will be made without prior notice.
 - * The pictures and technical descriptions in this manual may be different from the actual ones. Please refer to the actual objects and the instruction manual.
 - * There are many kinds of products, which can not be described one by one. For details, please contact our sales department or local distributors.
 - * The contents of this sample book are only used to explain the related information of this series of products.



Innovation, quality, service and integrity

PRODUCT Selection manual

**ZHEJIANG
ZHONGQIAO ELECTRICAL CO.,LTD**



Seeking development
through change,
connecting qiao to
the future

ZHONGQIAO
ELECTRICAL CO.,LTD

» Integrity management, Excellence, mutual benefit and scientific and technological innovation.

Smart ecological electric energy has changed our way of life.

Preface of enterpris

Zhong qiao always pursue new values and make continuous efforts to become an enterprise that contributes to society and industry!

Every stage of progress of Zhongqiao Electric Appliance is inseparable from the people who have worked hard for Zhongqiao. It is they who have made Zhongqiao successful and go to a higher road.

Excellent product quality makes Zhong qiao stand on the market for a long time. Our efficient technical team makes our products find favor in the eyes of our customers. Independent R&D room, professional technical personnel and excellent experimental equipment are the basis for Zhongqiao Electric to stand on the market for a long time. For many years, we have been committed to development of power industry and social development.

Today, in the face of profound changes both in the internal and external environment of the enterprise, Zhong qiao is actively complying with the new normal of the economy, implementing the development philosophy of "innovation, coordination, green, openness and sharing" put forward by the central government, uphold the important concept of "keeping the right path to bring forth new ideas and reaching a far future, taking"observing the business responsibility, demostating the dignity of the system and adhering to honesty and trustworthiness" as the guiding principle,and closely cooperating with the strategic direction of Zhong qiao market. The culture of zhong qiao has been deeply reflected and systematically combed.The concept system of Zhong qiao culture, in the new era has been forme on the basis of widely soliciting the opinions of managers and employees.

It includes five elements: mission, vision, values, development concept and enterprise spirit. Among them, the mission answers the question "Why do we exist?", which reflects the lofty responsibility of Zhong qiao as enterprises and is the internal driving force for the sustainable development of Zhong qiao. The vision answers the question of "where are we going?" It depicts the ideal blueprint of all workers to strive for, and it is the pursuit that Zhong qiao must establish to fulfill their solemn mission. Values answer the question of "how should we do it", are the core of Zhong qiao culture, and are the value standards and basic beliefs that all Zhong qiao must jointly believe in and always adhere to; The concept of development answers "what law should we follow", which is the general principle guiding the operation and management activities of Zhong qiao and the management philosophy that must be followed in order to fulfill the mission and realize the vision. Enterprise spirit answers the question "What kind of inner attitude and behavior style should we have?" It is the team temperament and spiritual outlook that all Zhong qiao should have, and it is the extension of Zhong qiao values in employees' thoughts and behaviors.

COMPANY PROFILE



One-stop electric appliance service provider!

Modern technology

Strict streamlined operation line, each process is fine and complete, and precision production equipment makes products closer to perfection.

Professional technical team

We have an independent R&D room and has obtained a number of patent certifications to meet the different needs of customers

Professional after-sales team

It is our purpose to serve customers 24/7, solve their problems. Our commitment to customers is to work in an efficient way.

Good faith&Mutual benefit



Zhejiang Zhongqiao Electric Appliance Co., Ltd. is committed to the field of high and low voltage electrical industry. The company has strong technical force, rich production experience, sophisticated manufacturing equipments, advanced technology and capable staff, and is equipped with a number of production lines and testing equipments. We comprehensively understand of the latest information in the industry, constantly introduce and absorb the latest technological achievements, and we continue to improve company's new product research and development capabilities. Taking the product demand, quality and service of the company's users as the center, and at the same time, with a professional, efficient and strong technical and service team, we provide pre-sales consultation and after-sales service for every customer.

The company is headquartered in Liushi, the electrical capital of China, and its main products are classified as: intelligent transmission and distribution terminal appliances, small circuit breakers, molded case circuit breakers, leakage circuit breakers, intelligent universal circuit breakers, dual power automatic transfer switches and intelligent dynamic composite switches. All products have passed the national compulsory 3C certification of China, ISO9001: 2008 quality system certificate and CE certification.

We will continue to strive for the concept of "meticulous creation and quality assurance", provide users with more perfect and professional electrical products with traditional technological advantages, and work hand in hand with our customers to create brilliance with first-class quality, first-class service and first-class reputation.

Zhongqiao Electric is committed to the cause of green and environmental -friendly electric energy , and helps the cause of modern electric energy!

20a

Twenty years of depth, twenty years of quality,
just for a better life.

+

In 2000, Zhongqiao electric appliance set sail quietly from here, and from then on, it embarked on a entrepreneurship road full of thorns but infinite hope. It has passed ISO9001 international quality management system certification successively, has an independent design and R&D room, and has obtained honorary certifications in many fields. It also has a professional technical team to serve our customers, meet the technical requirements under all conditions, and a professional after-sales service team, so that customers can be free from worries. For a long time, our after-sales aim is that after-sales will not stop until problems are solved. Modern production technology, scientific production mode and perfect management system are the foundation for Zhong qiao to stand on the market.

Looking back, the Zhong qiao has developed more brilliantly and thickly.

Going forward, the footsteps of Zhong qiao are more steady and heroic.

Looking forward to the future, Zhong qiao is making great strides towards a bright tomorrow!

ZHONGQIAO ELECTRICAL CO.,LTD



COMPANY CULTURE

■ Enterprise mission

Committed to becoming a well-known trademark in the high-voltage and low-voltage electrical industry, any development of the company must conform to the needs of the times, constantly innovate and promote the development of the electrical industry.

■ Corporate vision

In the future, the Zhong qiao electrical appliances should be high-tech electrical appliances, serving electrical appliances and internationalized electrical appliances.

■ Enterprise values

Dare to challenge, dare to innovate, people-oriented, customer-oriented, people-oriented, virtuous, self-improvement and far-reaching innovation.

■ Business philosophy

Integrity management, mutual benefit, market-determined future, quality-determined survival, brand-determined image, concept-determined development, and talent-determined rise and fall.



Good faith&Mutual benefit



24h All-weather service



Authentic guarantee

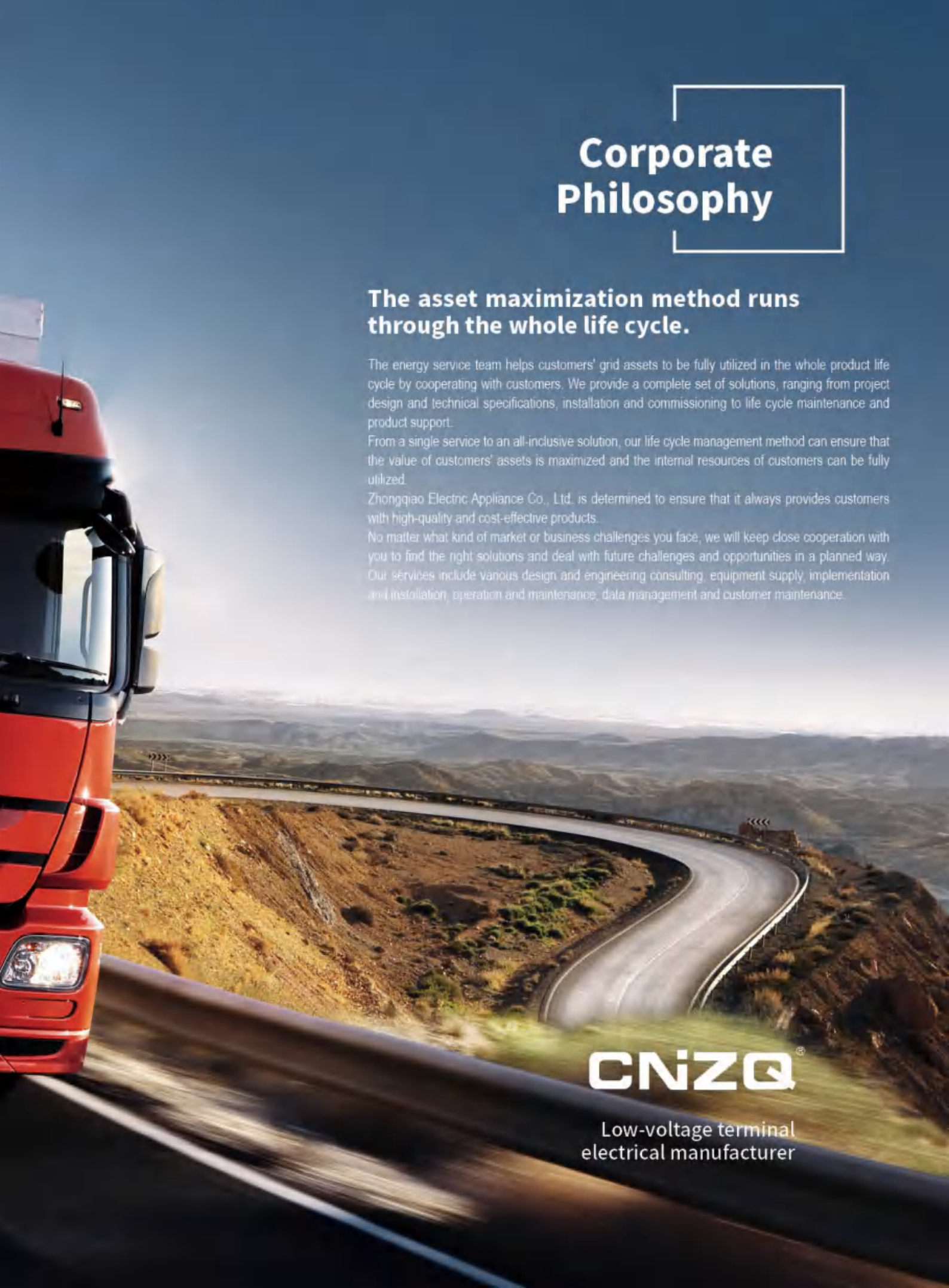


Express delivery



Technical support



A red truck is shown from the front-left, driving on a winding asphalt road that curves through a hilly, arid landscape. The background features rolling hills under a clear blue sky. The truck's headlight is on, and the road surface shows some motion blur.

Corporate Philosophy

The asset maximization method runs through the whole life cycle.

The energy service team helps customers' grid assets to be fully utilized in the whole product life cycle by cooperating with customers. We provide a complete set of solutions, ranging from project design and technical specifications, installation and commissioning to life cycle maintenance and product support.

From a single service to an all-inclusive solution, our life cycle management method can ensure that the value of customers' assets is maximized and the internal resources of customers can be fully utilized.

Zhongqiao Electric Appliance Co., Ltd. is determined to ensure that it always provides customers with high-quality and cost-effective products.

No matter what kind of market or business challenges you face, we will keep close cooperation with you to find the right solutions and deal with future challenges and opportunities in a planned way. Our services include various design and engineering consulting, equipment supply, implementation and installation, operation and maintenance, data management and customer maintenance.

CNIZQ®

Low-voltage terminal
electrical manufacturer

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Busbar

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Striving for perfection is the driving force that we have been insisting on. Grasp every detail to make the product more perfect.



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Intelligent
universal
circuit
breaker

Molded case
circuit breaker

Intelligent
molded case
circuit breaker

Leakage
molded case
circuit breaker

Miniature
circuit breaker

Self-resetting
overvoltage
and
undervoltage

dual power
switch

Load
disconnecter

Contactor
thermal relay

Branch/busbar

ZQW18

Intelligent universal circuit
breaker



ZQW18 Intelligent universal circuit breaker

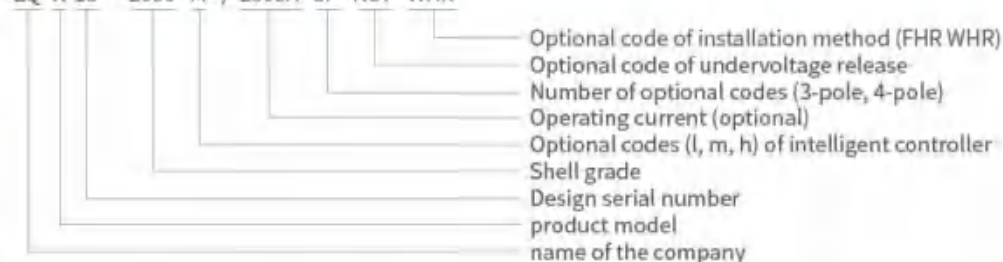


Product overview

- ◇ ZQW18 series intelligent universal low-voltage circuit breakers (hereinafter referred to as circuit breakers) are suitable for distribution network with AC 50Hz, rated voltage up to 660V(690V) and rated current below 400A~6300A to distribute electric energy and protect lines and power equipment from overload, undervoltage, short circuit, single-phase grounding and other faults.
- ◇ Circuit breaker has intelligent protection function, selective protection accuracy can improve the reliability of power supply and avoid unnecessary power failure. At the same time, with an open communication interface, four remotes can be carried out to meet the requirements of centralized control center and automation system.
- ◇ The circuit breaker has a pulse withstand voltage of 8000V at an altitude of 2000m (the maximum voltage at different altitudes should not exceed 12000V). This circuit breaker without intelligent tripping device and sensor can be used as isolator, marked as _____.
- ◇ Circuit breakers meet the standards of GB/T 14048.2 Low-voltage Circuit Breakers for Low-voltage Switchgear and Control Equipment and IEC60947-2 Circuit Breakers for Low-voltage Switchgear and Control Equipment.

Model and meaning

ZQ W 18 - 2000 M / 2000A 3P NST WHR



fill

- ◇ The frame grade current $I_{nm}=2000, I_{nm}=3200, I_{nm}=4000, I_{nm}=5000, I_{nm}=6300$.
- ◇ Optional code of intelligent controller
M standard basic function+intelligent function, with programming interface.
H-type basic function+intelligent function, with programming interface and communication interface.
L-type basic function
- ◇ rated current is optional.
2000A 400/630/800/1000/1250/1600/2000A
3200A 2000/2500/3200A
4000A 3200/4000A
5000A 4000/5000A
6300A 4000/5000/6300A
- ◇ 3 r esents three poles and 4 represents four poles
- ◇ Under-voltage release can be selected as NST NO YU, YU 220V or 380V (delayed or instantaneous).
- ◇ The installation method can be FHR fixed type, horizontal board rear wiring, WHR pull-out horizontal board rear wiring.

Normal working conditions and installation conditions

- ◇ Ambient air temperature
The upper limit shall not exceed +40 °C , the lower limit shall not be lower than -5 °C , and the average value within 24h shall not exceed +35°C .
Note: For working conditions with the lower limit of -10°C or -25°C , users should apply with our factory. Users in working conditions where the upper limit exceeds +40 °C or the lower limit is lower than 10°C or -25°C should consult with our factory.
- ◇ The altitude of the installation site shall not exceed 2000m.
- ◇ atmospheric condition
The atmospheric relative humidity is not more than 50% when the ambient air temperature is +40 °C , and it can be higher at a lower temperature. The monthly average maximum relative humidity of the wettest month is 90%, and the monthly average minimum temperature is +25°C , taking into account the condensation on the product surface due to the temperature change. Users who exceed the requirements should consult with our factory.



ZQW18

Intelligent universal circuit breaker

- ◇ Protection level IP30
- ◇ Use class b or class a.
- ◇ Installation category
Circuit breakers with rated working voltage of 660V (690V) and below, under-voltage trippers, and thousands of primary coils of power transformers are installed in category IV.
- ◇ Installation conditions
Circuit breakers shall be installed according to the requirements of this manual. The vertical inclination of circuit breakers shall not exceed 5°.

Technical data and performance

- ◇ Rated current of circuit breaker

Rated current I_{nm} (A) of rack rating	rated current I_n (A)
2000	(400) 630、800、1000、1250、1600、2000
3200	2000、2500、2900、3200
4000	3200、3600、4000
5000	4000、5000
6300	4000、5000、6300

- ◇ The rated short-circuit breaking capacity and short-time withstand current of the circuit breaker are "zero" (i.e. no flashover outside the circuit breaker).

Rated current I_{nm} (A) of rack rating		2000	3200/4000	5000/6300
The rated short circuit breaking capacity I_{cu} (kA)	AC400V /AC660V	80/50	100/65	120/85
Rated breaking capacity I_{cs} (kA)		65/50	80/65	125/75
The rated short-time withstand current I_{cw} (kA) is delayed by 0.4s		50/40	80/65	125/75

Note: The breaking capacity in the table is the same as the upper and lower feed lines.

- ◇ The maximum loss power of the circuit breaker is 360W, and the rated continuous current of the circuit breaker varies under different ambient temperatures.

Ambient temperature [°] C	rated current						
	400A	630A	800A	1000A	1250A	1600A	2000A
40	400A	630A	800A	1000A	1250A	1600A	2000A
50	400A	630A	800A	1000A	1250A	1600A	2000A
60	400A	630A	800A	1000A	1250A	1600A	2000A

- ◇ Protection characteristics and functions of M-type intelligent overcurrent controller, protection characteristics of overcurrent controller, setting value I_r (I/I_n) and error of controller

Long delay I_{r1}	Short delay		instant		Ground fault	
	I_{r2}		I_{r3}		I_{r4}	
$(0.4-1)I_n$	$(0.4-15)I_n$	$\pm 10\%$	$I_n-50kA(I_{nm}=2000A)$ $I_n-75kA(I_{nm}=3200A)$ $I_n-75kA(I_{nm}=4000A)$ $I_n-125kA(I_{nm}=6300A)$	$\pm 15\%$	$I_{nm}=2000 \sim 6300A (0.2-0.8)I_n$ (max. 1200A min. 160A)	$\pm 10\%$

Note: When there are (required) three sections of protection at the same time, the setting values can not cross.

ZQW18 Intelligent universal circuit breaker

Circuit breaker internal accessories

◇ The inverse time limit action characteristic of the long time delay overcurrent protection is $IT=(1.5I_r1) t_L$. The action time of $(1.05\sim2.0) I_r1$ is shown in Table 5, and the time error is $\pm 15\%$.

1.05I _{r1}	1.3I _{r1}	1.5I _{r1} setting time s	15	30	60	120	240	480
> 2h no action	< 1h action	2.0I _{r1} setting time s	8.4	16.9	33.7	67.5	135	270

Note: t_L - setting time of long delay of 1.5I_{r1} t action time of long delay.

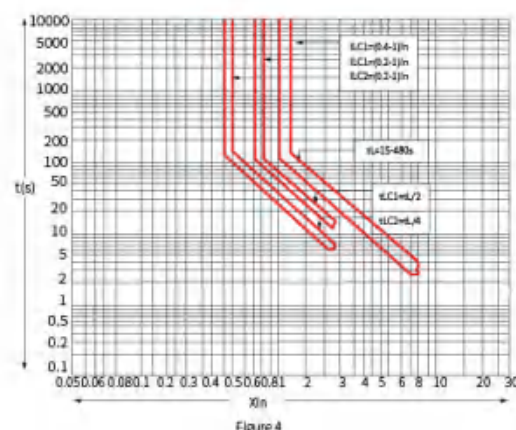
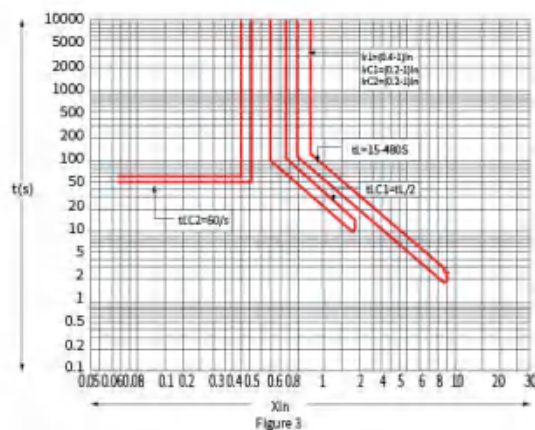
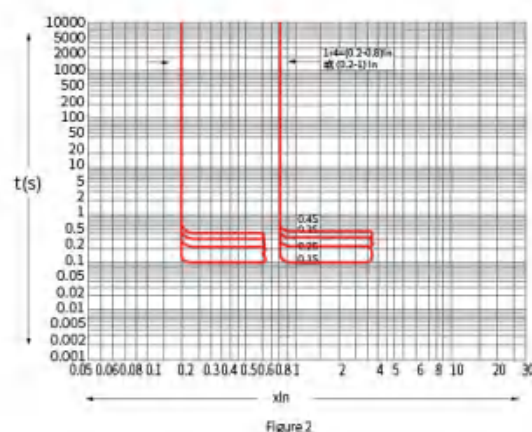
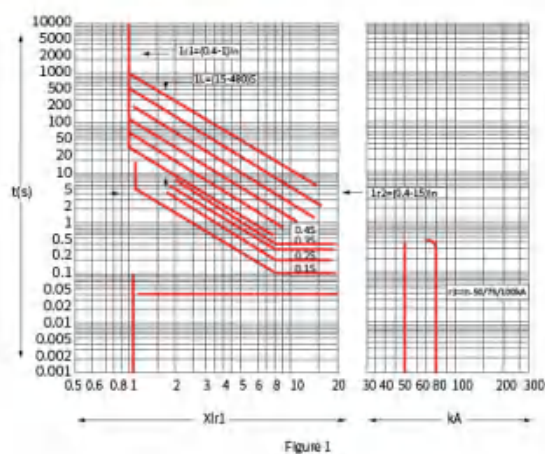
◇ short time delay overcurrent protection characteristics

The short time delay overcurrent protection is a definite time limit. If the low multiple is required to be an inverse time limit, its characteristics shall be $I t_s = (4I_r1) t_s$, and t_s is the general delay design time. T_s is the short time delay action time. When the overload current is greater than $4I_r1$, it is automatically converted to a definite time limit characteristic.. See Table 6 for its definite time limit characteristics. The error is 15%.

Delay time (s)				Shell return time (s)			
0.1	0.2	0.3	0.4	0.03	0.14	0.23	0.35

See Figure 1 for overcurrent tripping protection characteristics and Figure 2 for grounding fault protection characteristics.

characteristic curve





ZQW18

Intelligent universal circuit breaker

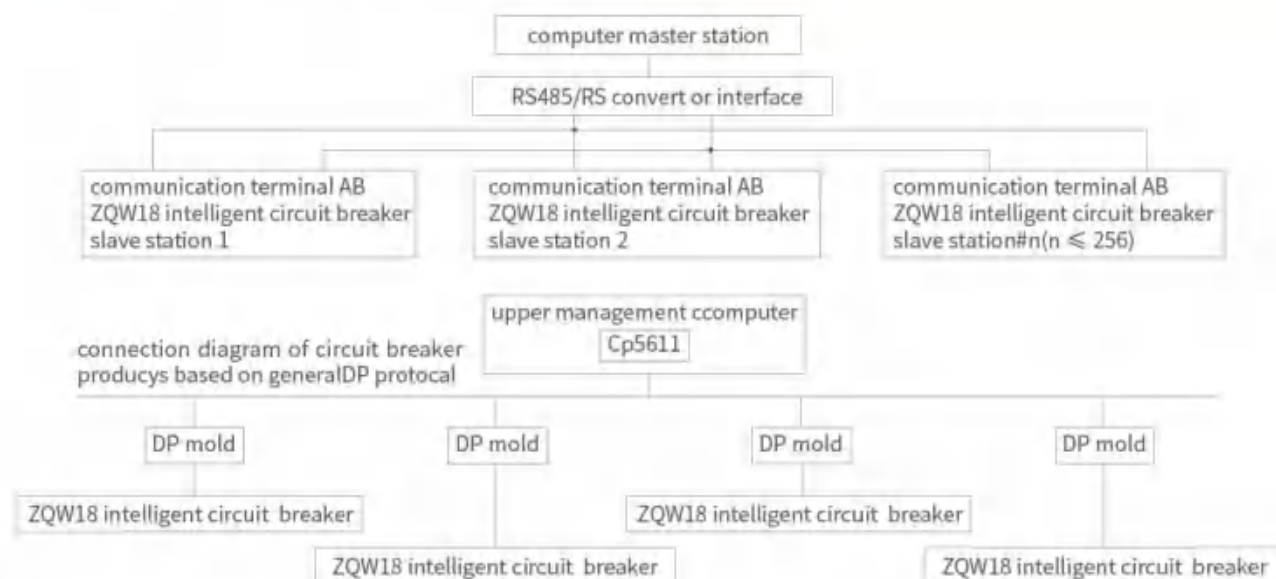
The function of M intelligent overcurrent controller

- a. Ammeter function: it can display the running current and ground leakage current of each phase, normally display the maximum phase current, and also display the current value or time value of setting, test and fault.
- b. Voltmeter function: it displays the voltage of each line, and normally displays the maximum value.
- c. Remote monitoring and diagnosis function
The controller has the function of local fault diagnosis, can send out the error "E" display or alarm, when the computer fails, and restart the computer at the same time, and disconnect the circuit breaker when the user needs it. When the local ambient temperature reaches 80°C, an alarm can be given and the circuit breaker can be disconnected when the current is small (when the user needs it).
The intelligent controller has the functions of overload, grounding, short circuit, load monitoring, pre-alarm, tripping indication (OCR) and other signals output through contacts or optical couplers to facilitate the user's external remote control contact capacity DC28V1 and AC125V1.
- d. Setting function
Use the four buttons of Set+Store to set various parameters of the controller. Set it to the desired setting state (indicated by the status indicator), then press the + or key to adjust the parameter size to the required value, and then press the storage button. If the storage button lights up once, the setting value is locked. The protection parameters of the controller shall not be cross set. After the controller is powered off and reset, press the setting key again to check the set parameters circularly.
- e. Test function
Using the set+trip and no trip reset keys, various protection characteristics of the controller can be checked. Use the set+key to adjust the test current of a simulated fault (be careful not to press the storage lock) and then press the trip or non-trip key to test the controller for fault handling. Press the tripping key to disconnect the circuit breaker. Press the non-tripping key not to break the circuit breaker, and the various indicating states of the controller are normal. After the test, press the reset or clear button to conduct other tests.
Note: For the convenience of the test, whether the grounding leakage is set at the tripping or alarm position, the tripping treatment shall be carried out, and the priority is lower than the overload protection. Once a fault occurs during the test, the controller will automatically stop all tests and enter into fault treatment.
- f. Load monitoring function (load 1, load 2)
Set two setting values, ILC1 setting range(0.2-1) In and ILC2 setting range(0.2-1) In. ILC1 delay characteristic is an inverse time characteristic, and its time setting value is 1/2 of the long delay setting value. There are two types of 1/2 ILC2 delay characteristics: the first type is an inverse time characteristic, its time setting value is 1/4 of the long delay setting value, and the second type is a fixed time characteristic, and its delay time is 60S. The former is used to disconnect unimportant loads at lower level when the current is close to the overload setting value, and the latter is used to cut off unimportant loads at lower level and then the current drops to keep the main circuit and important load circuit powered. When the current drops to ILC2, the command is issued after a certain delay to connect the cut off circuit at lower level again to restore the power supply of the whole system. Users of the above two types of monitoring protection can choose one of their monitoring characteristics as shown in Figure 3 and Figure 4.
- g. description of MCR on-off and off-limit tripping functions (optional)
The controller can choose MC daily on-off and off-limit tripping protection as backup protection functions. Both modes are instantaneous actions, and MCR current values are generally 40kA in frame I, 60kA in frame II and 80kA in frame III. The out of limit tripping current is generally 50kA in frame I, 75kA in frame II and 125kA in frame III. The fault current signal directly instructs the MC to turn on and break the protection on a daily basis through the hardware comparison circuit, which only works during the closing time (about 125ms) of the circuit breaker, while the out of limit tripping function always works during operation.
- h. Thermal memory function
After the controller overload or short-circuit delay tripping, it has the memory function of simulating bimetallic characteristics before the controller is powered off. The overload energy is released for 30min, and the short-circuit delay energy is released for 15min. During this period, overload, short-circuit delay fault, tripping time will be shortened, the controller is powered off, and the energy will be reset automatically.

H intelligent controller

In addition to all M-type functions, it also has a serial communication interface, through which a local area network system (hereinafter referred to as the system) with a master-slave structure can be composed. One or two computers are used as the master station and some intelligent circuit breakers or other communication interface components are used as the network structure of the slave station system (as shown in the following figure). The circuit breaker unit system, can realize "four remotes" functions to monitor various power grid parameters and operation parameters, monitor the adjustment and download of various protection limit parameters under the current operation state of intelligent circuit breaker, and control the on-off operation of intelligent circuit breaker. The system is suitable for the construction and transformation of distribution monitoring systems in various power stations, small and medium-sized substations, industrial and mining enterprises, buildings, etc. Connection diagram of special communication protocol interface.

ZQW18 Intelligent universal circuit breaker



◆ Composition of the system

a. hardware structure of data communication network system

The intelligent circuit breaker provides standard RS 485 communication interface, which is led out from No.10 and No.11 outgoing lines of the circuit breaker;

Category A shielded twisted pair of communication medium connected to the system

b. Main characteristics of the network

Two way serial data transmission, the product can provide a variety of communication protocols, such as PROFIBUS-DP MODE BUS, etc.

The strict master-slave mode, that is, the master station is the initiator and controller of communication, and the slave station can only communicate with the master station, but can not directly communicate with other slave stations.

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

c. Monitoring software

YS2000 configuration software can realize the configuration application of the monitoring and management software required according to different engineering requirements, and can realize operation monitoring and various daily management functions for intelligent circuit breakers.

◆ System function

a. Remote control

Remote control is the operation control of energy storage, closing and opening of each slave circuit breaker in the system through the master computer. The operator selects the corresponding object from the system interface and clicks the remote control button with the mouse to provide the current running state of the corresponding object. After the operator inputs the operation password, he can issue the remote control "close" or "open" command. The system will transmit the command to the corresponding circuit breaker slave station, and after receiving the instruction, the slave station performs the operation of breaking, closing and storing energy and other operations according to the established time sequence, and reports the remote control results to the master station.

b. Remote adjustment

Remote adjustment refers to the setting of the protection setting of the slave station through the master station computer. All the protection settings of slave stations are stored in the master station computer. The operator selects the corresponding object from the system interface, and clicks the remote adjustment button with the mouse. The system will provide the current settings of all the protection settings of the corresponding object and the protection settings table of this object. After the operator inputs the operation password, he can select the required parameters from the parameter table and click the corresponding button. The master station will download the parameters to the corresponding slave stations and report the remote adjustment results. The slave stations will modify their own protection settings after receiving the instructions.

c. Telemetry

Telemetry refers to the real-time monitoring of power grid operation parameters of each slave station through the master computer. The communication substation reports the working parameters to the upper computer as follows: the real-time A, B, C and N phase current values of each substation, the voltage values of UAB, UBC and UCA, etc.

ZQW18 Intelligent universal circuit breaker

◆ Fault record can record the following fault parameters

A, B, C, N phase current value in case of fault: voltage value of UAB, UBC, UCA, fault type, fault action time, and record the fault in the fault database.

◆ The computer displays the current real-time current and voltage of each substation in bar graph, absolute value table, etc., and displays the running status of each node by real-time curve.

d. Telecommunication

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

e. other functions of the system

In addition to the four remote operation control functions, the system can also perform a variety of management functions, such as accident alarm (information screen, picture push, event printing, accident dialing, sound alarm), event recording, maintenance and listing, shift management, load trend analysis, and various report forms printing.

L type intelligent controller

◆ The L-type controller adopts the setting mode of coded switch and toggle switch. It has the characteristics of overload long time delay, short circuit short time delay, instantaneous and earth leakage, as well as the functions of fault states and load current light column indication etc., but its digital display function is not as complete as M-type and (H)-type, which is available for users to choose in general occasions.

◆ The operating performance of circuit breaker, the operating performance of circuit breaker is expressed by the number of operating cycles, as shown in the table.

Rated current I_{nm} (A) of rack rating	Operation loop counting
2000	12500
3200/4000	12500
5000/6300	8000

Attachment introduction

◆ Undervoltage release

Undervoltage release consists of the release coil and the control unit;

Undervoltage release action can be divided into instantaneous action and delayed action;

The delay time of undervoltage delay release is divided into 1s, 3s, 5s. The delay time is more than 5s until 9s for special specification;

The circuit breaker will not open when the power supply voltage of the main circuit recovers to 85% U_e or above within 2/1 delay time.



Rated working voltage U_e	AC380	AC220
Action voltage	(0.35-0.7) U_e	
Reliable closing voltage	(0.85-1.1) U_e	
Reliable non-closing voltage	< 0.35 U_e	
power consumption	36VA	24VA

◆ shunt tripping device

Optional distance manipulation opens the circuit breaker.



Rated control voltage (V)	AC380	AC220	AC110
Action voltage (V)	(0.7-1.1) U_e		
Instantaneous current (A)	0.7	1.3	1.3
break-time	No more than 30ms		
power consumption	36VA	24VA	24VA



ZQW18 Intelligent universal circuit breaker

◆ Closing electromagnet

After the energy storage is finished, the closing electromagnet can instantly release the energy storage spring of the operating mechanism so that the circuit breaker can be closed quickly.



Rated control voltage (V)	AC380	AC220	AC110
Action voltage (V)	(0.85-1.1)U _e		
Instantaneous current (A)	0.7	1.3	1.3
break-time	No more than 70ms		
power consumption	36VA	24VA	24VA

◆ Electric operating mechanism

The circuit breaker has motor storage room and automatic restorage function
The circuit breaker can also store energy manually.



Rated control power supply voltage (V)	AC380	AC220	AC220
Action voltage (V)	(0.85-1.1)U _e		
power consumption	85W/110W/150W I / II / III		≤ 200W
Energy storage time	No more than 5s		

◆ Auxiliary switch



Rated voltage (v)		Ith(A) of agreed heat generation	Rated control capacity
AC	220	6	300VA
	380		
DC	220		60W

Note: The standard type of auxiliary switch is 4 groups of changeover contacts for users, and the special type is 3 normally open 3 normally closed 5 groups of changeover contacts 4 normally open 4 normally closed.

- ◇ Key lock;
- ◇ The breaking button of the circuit breaker can be locked at the pressed position. At this time, the circuit breaker cannot be closed;
- ◇ The factory will provide locks and keys after the users choose to install them;
- ◇ A circuit breaker is equipped with an independent lock and a key (one lock and one key)
- ◇ Two circuit breakers are equipped with two identical locks and one key (two locks and one key)
- ◇ Three circuit breakers are equipped with three identical pins and two identical keys (three locks and two keys).

Overview of structure

- ◇ Fixed circuit breaker is mainly composed of contact system, intelligent controller, manual operating mechanism, electric operating mechanism and mounting plate, while drawer circuit breaker is mainly composed of contact system, intelligent controller, Manual operating mechanism, electric operating mechanism and drawer base. The circuit breaker is arranged as main body, featuring compact structure and small volume. The contact system is enclosed in the insulating base plate, and each phase of the contact is also separated by an insulating plate, which is opened into small rooms. The intelligent controller, manual operating mechanism and electric operating mechanism are sequentially arranged in front of them to form their own independent units. If one of the units is broken, the whole unit can be removed and replaced with a new one.



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- ◇ Drawer circuit breaker is composed of plug-in circuit breaker and drawer base. The guide rail in the drawer seat can be pushed and pulled out. The inserted circuit breaker is located on the guide rail to enter and exit. The main circuit is connected through the insertion connection of the busbar and the bridge contact on the drawer base.
- ◇ The drawer-type circuit breaker has three working positions: the "connecting" position, the "testing" position and the "separating" position. The position change is realized by screwing the handle in or out. The indication of the three positions is displayed by the pointer on the beam of the drawer base.
- ◇ When it is in the "Connection" position, both the primary circuit and the secondary circuit are connected; when it is in the "Test" position, the primary circuit is disconnected and insulated. Only the secondary circuit is connected, and some necessary action tests can be carried out. When it is in the "separation" position, the main circuit and the secondary circuit are all disconnected, and the drawer-type circuit breaker has a mechanical interlocking device. The circuit breaker can only be closed when it is in the connection position or the test position, while the circuit breaker cannot be closed at the middle position and test. See Figure 7 for the front indication of the circuit breaker.

Product mix



structural characteristics

- ◇ Use of circuit breaker
 - Operation of drawer circuit breaker
 - insertion operation of circuit breaker body
 - a. Pull out the guide rail
 - b. Place the circuit breaker body on the guide rail as shown in the figure, Note that the two protruding seats of the circuit breaker should be clamped into the groove of the guide rail;
 - c. Push the circuit breaker body inward until it can't be pushed.





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- d. Pull out the handle and insert the hexagonal head of the handle into the handle hole of the drawer base.
- e. Turn the handle clockwise until the position indicator turns to the "Connect" position, and you can hear the two sides of the drawer base click twice then pull out the handle and put it in place.



◆ Withdrawal operation of circuit breaker body

- a. First, move the breaker body from the "connection" position to the "separation" position (shake the handle counterclockwise).
- b. After pulling out the handle, pull out the circuit breaker body as shown in the figure. Pay attention to prevent the circuit breaker from tipping and falling due to the forward movement of the center of gravity when pulling out the circuit breaker body.
- c. Take the breaker body out of the drawer as shown in the figure, and then push the extraction guide back to its original position.



◆ Locking of the "separation" position of the drawer circuit breaker (padlock is purchased by the user)

- a. Pull out the locking rod as shown in the figure.
- b. When the padlock is inserted the circuit breaker cannot be moved from "separation" to "test" or "connection" position.

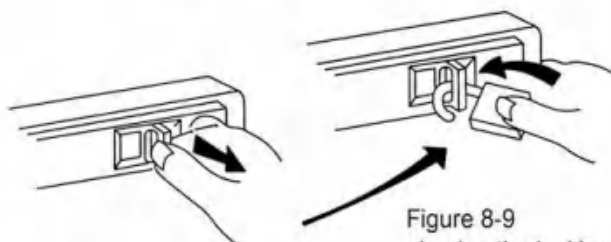


Figure 8-8
pulling out the locking lever

Figure 8-9
piercing the locking lever

◆ Energy storage operation-manual energy storage

- a. During energystorage, pull the energy storage handle up and down repeatedly for 6-7 times until a "click" sound is heard. When the hand can't feel the counter force energy storage indication, the "energy storage" end is displayed.. Figure 8-10
- b. After energy storage is completed, the indicator of "energy storage and energy release" is in the "energy storage" position.

◆ Energy storage operation-electric energy storage

The electric energy storage mechanism automatically stores energy immediately after the control circuit is powered on (when the control circuit has been connected to the automatic pre storage form).



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◆ Opening and closing operation-manual opening and closing operation.

- Closing: when the circuit breaker is in the state of energy storage and disconnection, push the green "I" button, and the indicator of "opening and closing" of the circuit breaker will change from "0" to "I", and the indicator of energy storage and energy release will change from "energy storage" to "energy release". Figure 8-11.
- Switch-off: When the circuit breaker is in the closed state,, push the red "0" button, and the opening indication of the circuit breaker will change from "I" to "0". Figure 8-12.

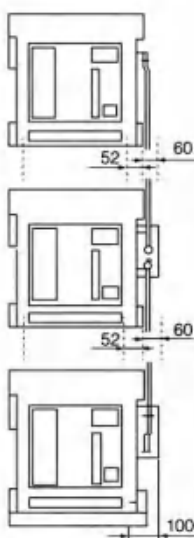
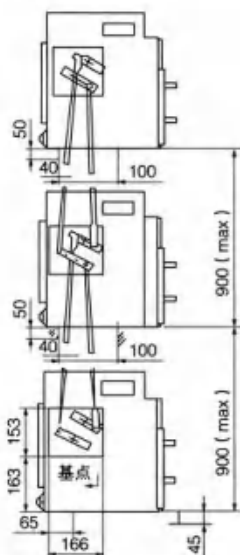
◆ Opening and closing operation-electric opening and closing operation

- Closing: when the circuit breaker is in the state of energy storage disconnection, apply the rated voltage to the closing electromagnet to close the circuit breaker .
- break-off: when the circuit breaker is in a closed state, the circuit breaker can be opened by applying the rated voltage to the shunt release.



◆ Interlocking mechanism of circuit breaker (applicable to drawer type and fixed type)

(see fig. 9a for lever interlocking)



(circuit breaker base drawing 9a)

Note:

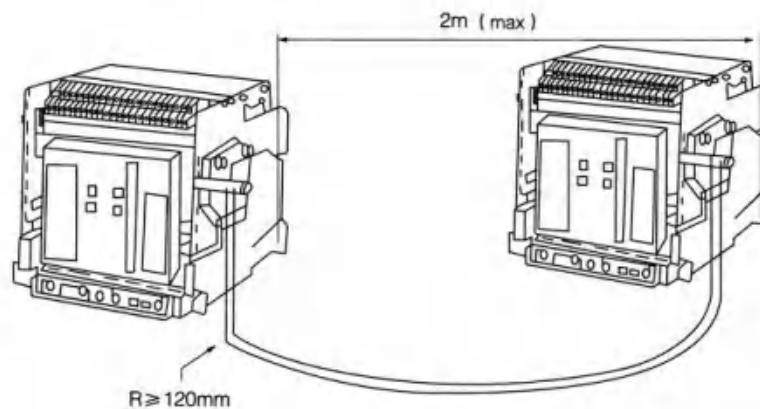
Three vertically installed circuit breakers with lever interlocking.

If two circuit breakers are interlocked, only the top circuit breaker should be removed.

circuit diagram	possible operation mode		
	1QF	2QF	3QF
	0	0	0
	0	0	1
	0	1	0
	1	0	0

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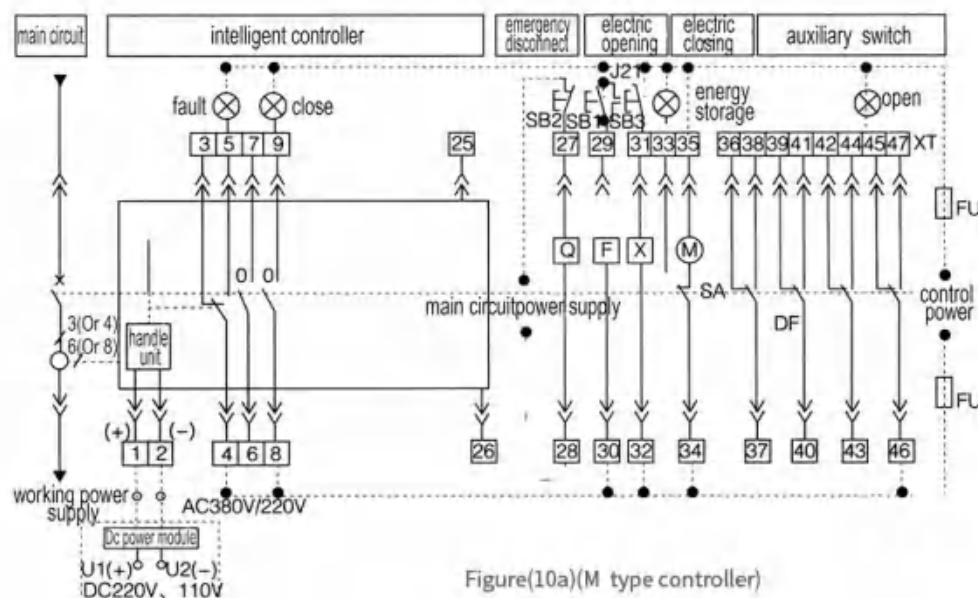
◆ Soft interlock (both horizontal and vertical) (see Figure 9b)



(Figure 9b)

◆ Wiring terminal

There are 47 wiring terminals of the overall circuit breaker, and 51 can be used for special requirements. The wiring is simple and convenient for users. See Figures 10a and 10b for wiring the diagrams.



Figure(10a)(M type controller)

Note:

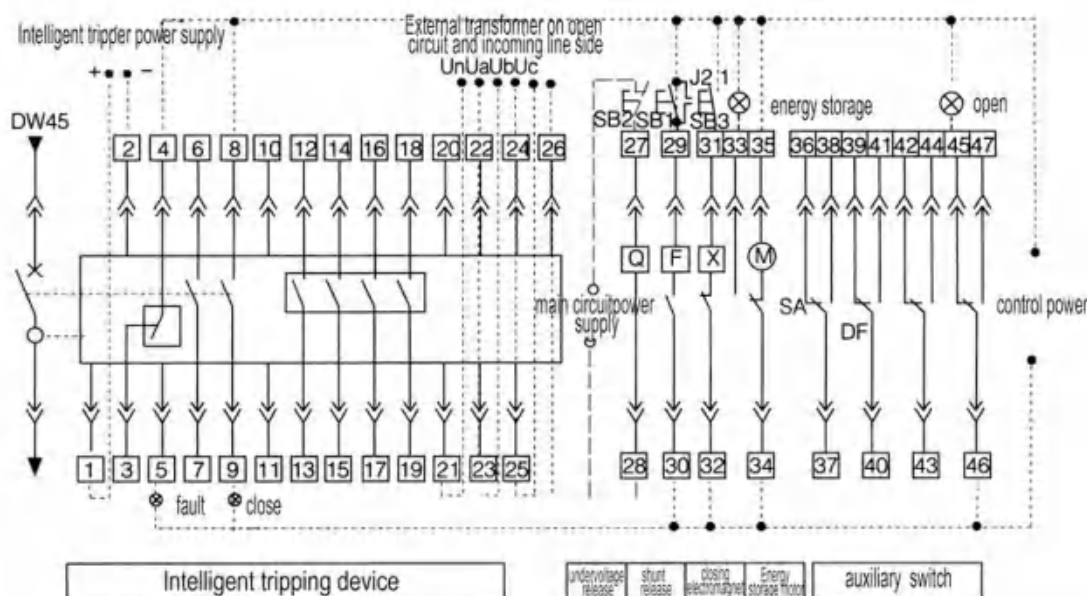
- ◇ If the control power supply voltages of F X and M are different, they should be connected to different power supplies respectively;
- ◇ Terminal #35 can be directly connected to the power supply (automatic pre energy storage) or connected to the power supply after the closing button(manual pre energy storage) .
- ◇ If the user proposes that terminals #6 ~ #7 dynamic breaking contact can be output.
- ◇ Additional accessories are provided by users themselves;
- ◇ When the working power supply of the intelligent controller is DC current, the DC power supply module must be added (at this time #1#2 terminals can no longer be connected to the AC power supply). The secondary wiring is shown in the figure (DC 110V or 220V is connected to the secondary base terminals 1(+) and 2(-)respectively from the two output terminals of the U1(+) and U2(-) input power modules).
- ◇ Other wiring of intelligent controller.
 - #1, #2 AC working power input (input from DC power modules U1, U2 in case of DC);

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#25 and #26 are external neutral or ground current transformer input;

SB1- shunt button (provided by the user) X- closing electromagnet DF- auxiliary contact Q- under-voltage release or under voltage delay release SB2- under-voltage button (provided by the user), M- energy storage motor, F- shunt release and O- moving contact (3A/ac380V);

SB3- Closing button (provided by the user), XT terminal, SA- motor microswitch and signal lamp (provided by the user)



Figure(10a)(The controller is M type with additional functions or H type.)

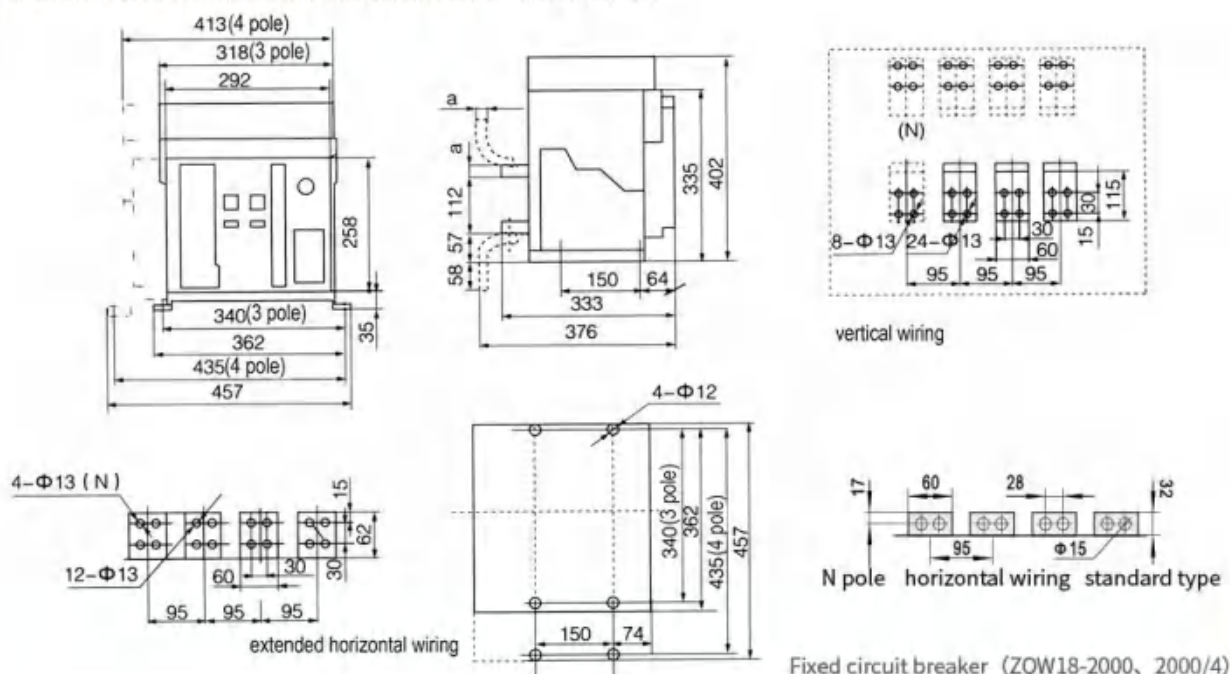
Note:

- ◇ If the control power supply voltages of F X and M are different, they should be connected to different power supplies respectively
 - ◇ Terminal #35 can be directly connected to the power supply (automatic pre energy storage) or connected to the power supply after the closing button(manual pre energy storage) .
 - ◇ If the user proposes that terminals #6 ~ #7 normally closed contacts can be output.
 - ◇ Other wiring of the telligent controller
 - #1#2 working power input (input from DC power module U1 and U2 in case of DC)
 - #12 overload prediction alarm signal output
 - #14 Instantaneous short delay tripping signal output
 - #15 long delay tripping signal output
 - #16 grounding (or neutral) fault tripping signal output
 - #19 signal output common line
 - #20 Self-diagnosis signal output
 - #21 Tripping signal (or for shunt or undervoltage actuator)
 - #25, 26 External neutral pole or ground current transformer input
 - ◇ Other wiring of intelligent controller
 - SB1- shunt button (provided by the user) X- closing electromagnet DF- auxiliary contact Q- undervoltage release or undervoltage delay release
 - SB2- Undervoltage button (provided by the user) M- Energy storage motor F- shunt tripping O- dynamic contact (3A/ AC380V)
 - SB3- closing button (provided by the user) XT terminal SA- motor microswitch signal lamp (provided by user)
- The dashed line part is wired by th users the above four groups of #12-#19 contact functions are the fault state of H type when leaving the factory.

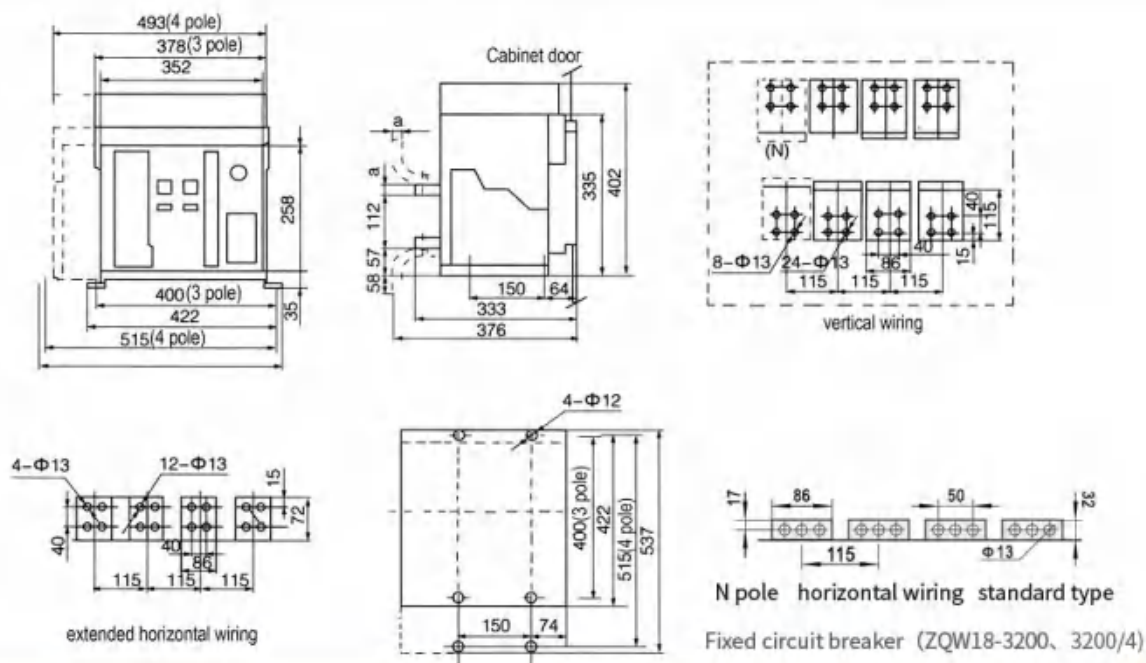
ZQW18 Intelligent universal circuit breaker

Outline and installation dimensions

◆ Installation dimensions and overall dimensions of fixed circuit breaker



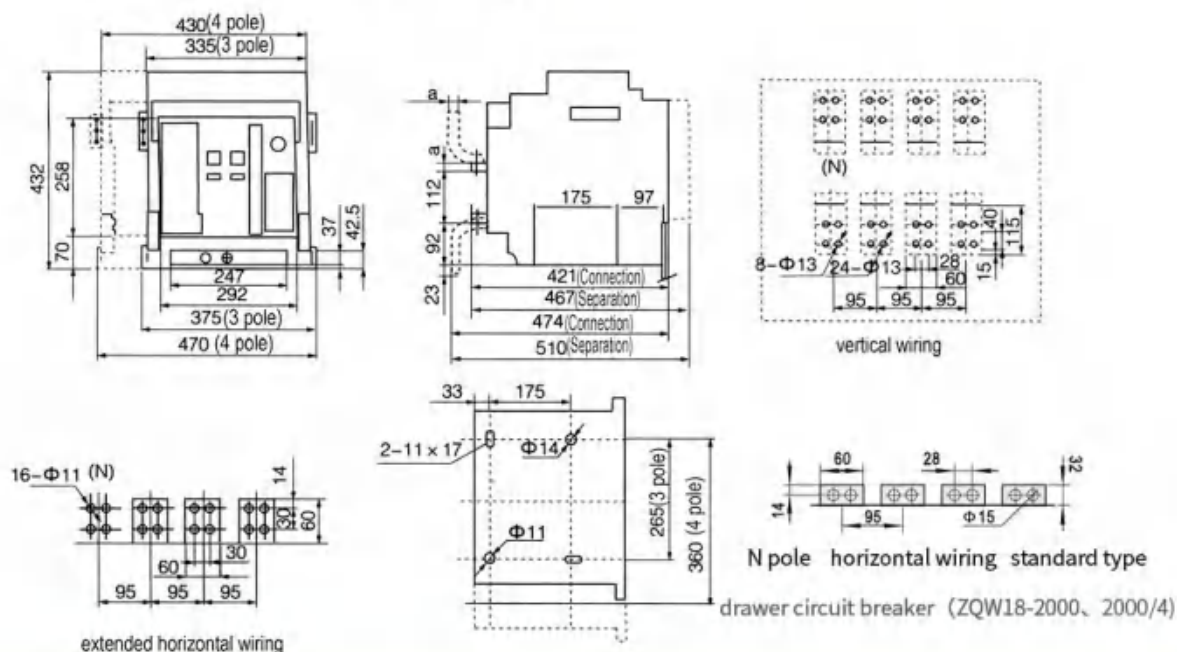
In(A)	a(mm)
400、800	10
1250、1600	15
2000	20



In(A)	a(mm)
2000、2500	20
2900、3200	30

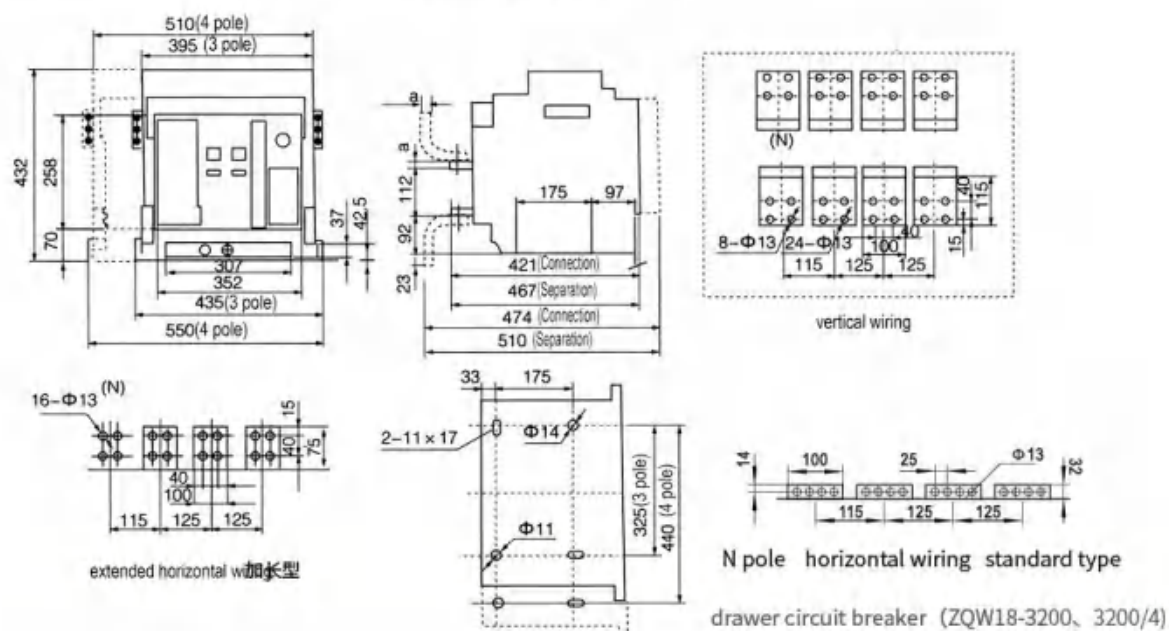
ZQW18 Intelligent universal circuit breaker

Installation dimensions and outline dimensions of drawer-type circuit breaker



In(A)	a(mm)
400、800	10
1250、1600	15
2000	20

Installation dimensions and outline dimensions of drawer-type circuit breaker

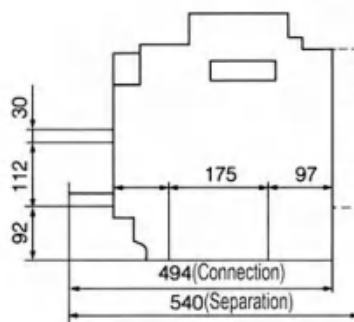
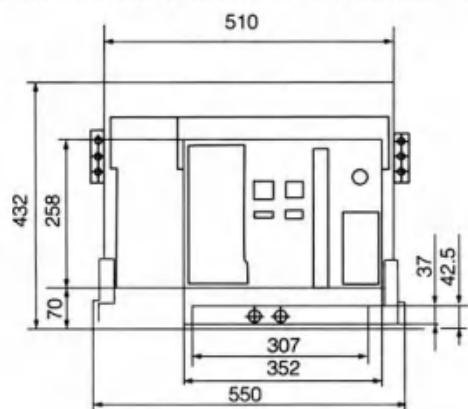


In(A)	a(mm)
2000、2500	20
2900、3200	30

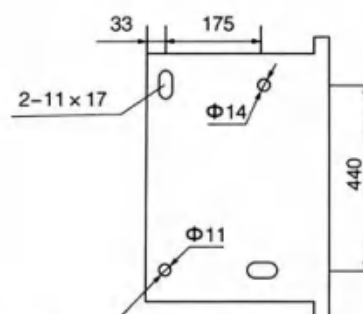
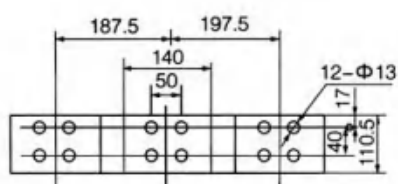


ZQW18 Intelligent universal circuit breaker

◆ Installation dimensions and outline dimensions of drawer-type circuit breaker

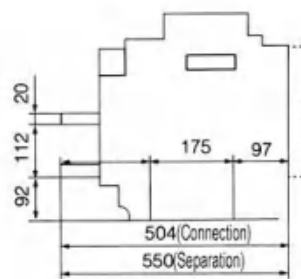
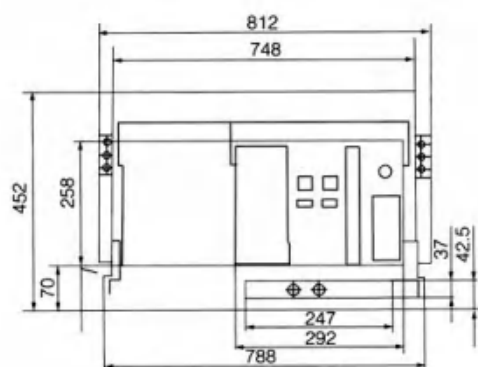


Note : The left and right dimensions of the center of the panel breaker are 57.5

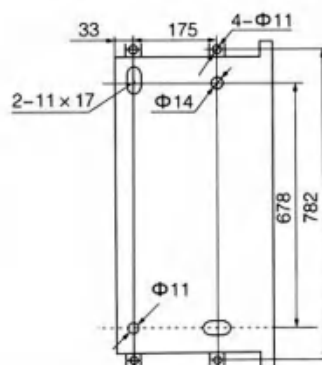
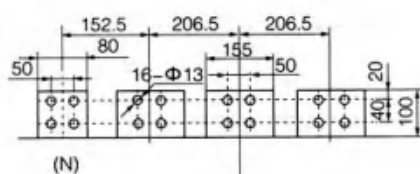


drawer circuit breaker (ZQW18-4000/3P 4000A)

◆ Installation dimensions and outline dimensions of drawer-type circuit breaker



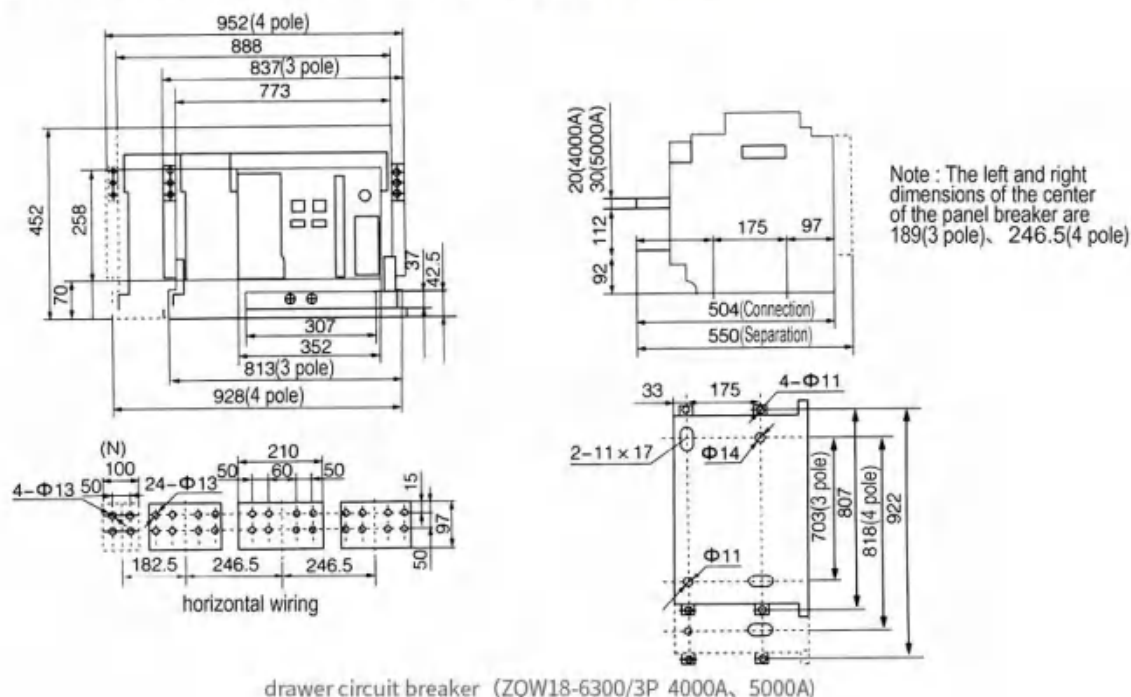
Note : The left and right dimensions of the center of the panel breaker are 206.5



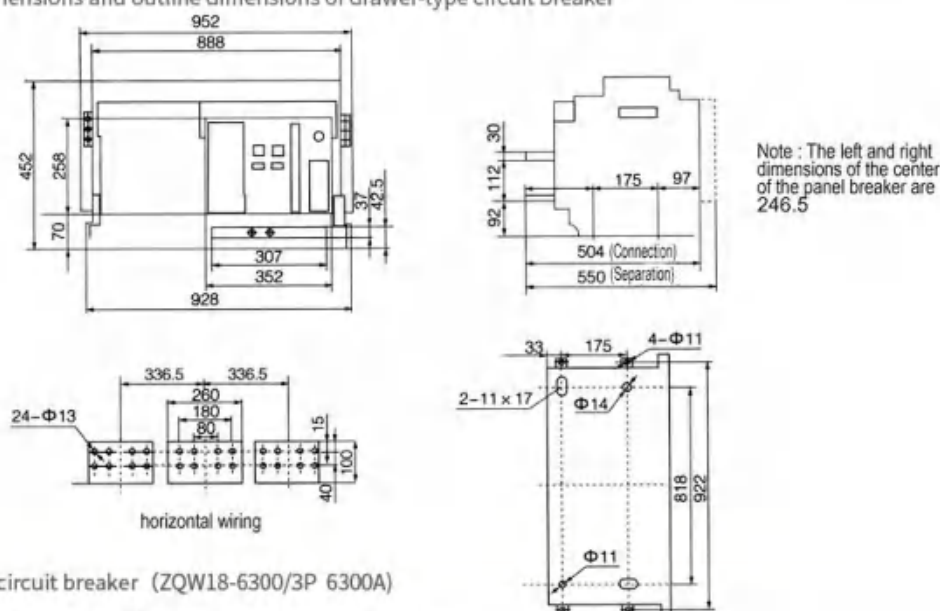
drawer circuit breaker (ZQW18-4000/4P 4000A)

ZQW18 Intelligent universal circuit breaker

◆ Installation dimensions and outline dimensions of drawer-type circuit breaker



◆ Installation dimensions and outline dimensions of drawer-type circuit breaker

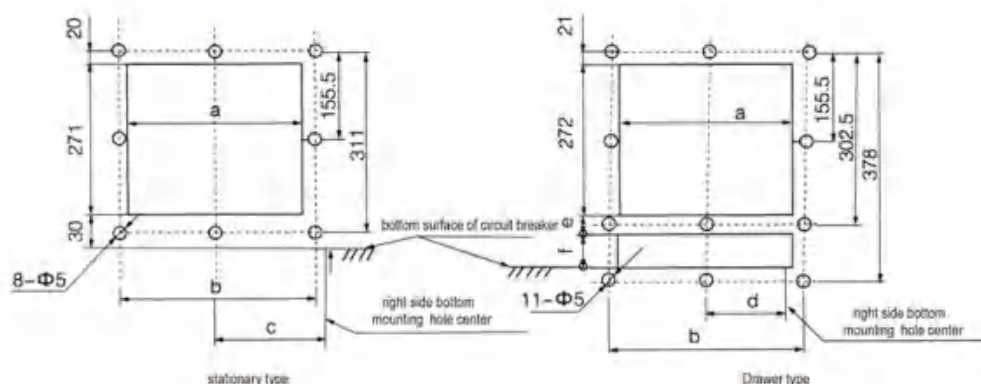


◆ Specification and quantity of copper bars connected by users

rated current	Specification of external copper bar	number per limit	rated current	Specification of external copper bar	number per limit
630A	40x5	2	2000A	125x5	3
800A	50x5	2	2500A	120x5	3
1000A	60x5	2	3600A	120x10	4
1250A	80x5	2	4000A	120x10	4
1600A	125x5	2	5000A	125x10	6
2000A	125x5	3	6300A	120x10	6
2500A	125x5	4			

ZQW18 Intelligent universal circuit breaker

Door frame size and installation hole spac



In	a (mm)	b (mm)	c (mm)	e (mm)	f (mm)	d (mm)
2000	304	345	170	15	46.5	132.5
3200	365	405	211	21	48	162.5
4000/3	365	405		21	48	162.5
4000/4	365	405		21	48	132.5
6300	365	405		21	48	162.5

Installation and maintenance

◆ Installation

- ◇ Before installation check whether the specifications of the circuit breaker meet the requirements.
- ◇ Before installation, use a 500V megger to check that the insulation resistance of the circuit breaker should be no less than 10MΩ when the ambient medium temperature is 20°C, ±5°C and the relative humidity is 50% and 70%, or it should be dried until the insulation resistance meets the requirements.
- ◇ When installing the circuit breaker, its base should be in a horizontal position and fixed with M10 screws.
- ◇ During installation, the circuit breaker shall be reliably grounded for protection, and there shall be obvious grounding marks at the grounding point.
- ◇ The upper incoming line or lower incoming line of the circuit breaker does not change its technical performance.

◆ Operation test

- ◇ After the circuit breaker is installed connect wires according to the relevant wiring diagram.
- ◇ Before the main circuit is energized (the indicator on the drawer seat of the drawer type circuit breaker is at the test position), the following operation tests shall be conducted:
 1. Check whether the voltage of the undervoltage, shunt release, energy release (closing) electromagnet and electric operating mechanism are consistent (the undervoltage release must be powered on before the circuit breaker is closed).
 2. Pull the handle on the mask up and down. After seven times, the rear panel shows "energy storage" and the energy storage is finished with a click. Press the "1" button or the energy release (closing) electromagnet to power on the circuit breaker to reliably close (when the controller reset button is reliably reset), and the handle can be pulled to store energy again.
 3. The motor is powered on and operated until the mask shows "energy storage" with a "click". After the energy storage is finished, the motor will automatically power off, and press the "1" button or the energy release (closing) electromagnet iron power on circuit breaker is reliably closed.
 4. After the circuit breaker is closed, whether the undervoltage, shunt release or the "0" button on the mask or the tripping test of the intelligent release can make the circuit breaker open.
- ◇ The panels of M-type and H-type intelligent release are shown in the figure.
- ◇ See Table 10 for the function description of keys and indicator lights of M and H intelligent releases.
- ◇ The setting can be adjusted online on the controller, but the load current should be less than the setting current. The power supply mode of the controller can use the auxiliary power supply (see Figure 10a and 10b for its wiring mode).
- ◇ The controller panel inputs DC24V.
- ◇ M-type, H-type intelligent release.
- ◇ Setting of M and H intelligent release.
- ◇ For the setting of the overload long delay current Ir1, first press the "Clear" key, and then press the "Set" key continuously until the yellow light of overload long delay current status indicator "Ir1" lights up. At this time, the nixie tube displays the current setting value of Ir1 (the factory setting value is In). Press the "+" and "-" key as needed by the user, and increase or decrease at an interval of ≤ 2A every time until the displayed value is closest to the user's required setting current value. Then press the "storage" button once, and the storage green light turns on and off again, indicating that the new overload long delay current setting value has been stored and Ir1 setting is completed.

ZQW18 Intelligent universal circuit breaker

- ◇ To set the overload long time-delay action time t_L : Press the "Set" button until the yellow light "tL" of the overload long time-delay action time status indicator lights up. At this time, the nixie tube displays the current setting value (factory setting value is 15 seconds). Press the "+" and "-" buttons to increase or decrease the action time according to the data in Table 5. After adjusting to the nearest required action time, press the "Storage" button once. When the green light turns on and off again, it means that the overload long delay action time has been set.
- ◇ The setting methods of action current and action time for protection and load monitoring such as short circuit short time delay, short circuit instantaneous, asymmetric grounding (neutral connection) are similar to those for overload long time delay, except that different protections correspond to different status indicators. For example, the setting of short-circuit short time-delay protection current I_{r2} corresponds to the yellow light of short-circuit short time-delay current status indicator "Ir2", the setting of its action time corresponds to the yellow light of its action time status indicator "ts", and so on.
- ◇ In addition, if the action time of short circuit short delay protection or overload long delay protection or asymmetric grounding (neutral connection) protection is set to the "OFF" position, it means that in case of short circuit short delay protection or overload long delay protection or asymmetric grounding (neutral connection) fault, only the alarm will be given without tripping. The setting of asymmetric grounding (neutral connection) protection or overload long time delay protection or short-circuit short time delay protection current or short-circuit instantaneous protection current at the "OFF" position indicates that the protection of the corresponding section does not work.
- ◇ In case of line fault during the setting process, the intelligent release will block the setting function and automatically enter the line fault processing state, and implement protection according to the stored setting value.
- ◇ After the protection parameters of the intelligent release are set, press the "Clear Light" key once again and the system will be in operation immediately. If the key is not pressed for 1 minute after the setting, the system will automatically return to the operation state.

Use of intelligent releases

- ◇ Test of M-type and H-type intelligent release.
- ◇ After setting the protection parameters of the intelligent releases, users can test various protection functions of intelligent releases as required before or during operation to check the operation status and protection accuracy of intelligent releases. The tests of intelligent release includes tripping test and non-tripping test. When the tripping test is done, press the "tripping" button. When the test is completed, the test result will be displayed and tripping action will be sent. When the circuit breaker is disconnected, press the "non-tripping" button. When the test is completed, only the test result will be displayed and the tripping action will not be sent. If the circuit breaker is running in the power grid, the non tripping test is usually carried out.
- ◇ Test method of intelligent release: Take the overload long delay test as an example. Press the "Set" key to the overload long delay setting state, and check the overload long delay setting values I_{r1} and t_L , and then continue to press, press the "Set" key to the short circuit short delay or short circuit instantaneous setting current state, and then press the "+" key to adjust the displayed current to a value greater than $1.3I_{r1}$ (please note that do not press the "Store" key at this time, otherwise the original set parameters will be changed). Press the "Trip" or "No trip" key once, and the yellow light of "Test" will be on (indicating that it is in the test state), and the test of the overload long delay will start. The intelligent release operate in time delay according to the overload long time-delay inverse time rule, and the action time is calculated from the corresponding characteristic expression according to different protection characteristic curves. In the process of delay, the yellow light of overload long delay current indicator "Ir1" flashes. When the action time is up, the red light of fault state "Ir1" lights up (if it is a tripping test, the tripping action is sent to make the circuit breaker open and the red light of tripping lights up, indicating that it has been tripped). At this time, the digital tube alternately displays the delay action time and the test current. Other protection characteristic tests are similar, except that different status indicator yellow lights flash during the test and different fault status red lights turn on at the end of the test.
- ◇ Note that the test results of the intelligent release are not memorized!
- ◇ If only the "Test" yellow light is on during the test, and the yellow lights of other status indicators do not flashing, the ammeter window will display "nodo" indicating that the current value of the test is adjusted too low. If the test is not running, press the "Clear Light" key to return to the normal operation state. If it is a tripping test, press the red mechanical "reset" button to close the circuit breaker.
- ◇ In case of the line fault during the test, the intelligent release will automatically cancel the test and enter the fault handling state.
- ◇ Fault Inspection of M and H Intelligent releases
- ◇ Press the "fault inspection" key after "light off" and the system will alternatively display the fault current and fault action time. At this time, press the selection key to check the current value of each phase and the harmonic influence coefficient value under the last fault. Press the "Clear Light" key to exit the fault check and return to the running state.
- ◇ Display inspection of M and H intelligent releases
- ◇ After "light off", press and hold the "display inspection" key, and all light-emitting devices should light up. Release the "display inspection" key and the system will return to the operating state immediately.
- ◇ Query the voltage parameters of M and H type intelligent releases (with voltage display)
Press the "Query" key after clear and the voltmeter window will display cyclically line voltage V_{ab} , line voltage V_{bc} , line voltage V_{ca} , phase voltage V_a , phase voltage V_b , phase voltage V_c , frequency and maximum line voltage.

ZOW18

Intelligent universal circuit breaker

- ### Protection priority of intelligent release

The protection priority of intelligent release is as follows: short circuit instantaneous > short jcircuit short delay > asymmetric grounding (zero connection) > overload long delay.

- ◆ Other instructions for use of intelligent release

Once the intelligent release enters the line fault processing state, all keys are blocked, and pressing any key at this time has no effect.

The intelligent release can automatically respond to the line fault and enter the line fault processing state under various functional states (except the line fault processing state).

Under various functional states (except the line fault handling state), the intelligent release can immediately return to the operating state if the "light off" key is pressed. If no key is pressed for 1 minute, it will automatically return to the operating state.

After the intelligent release sends out the tripping action, the circuit breaker can only be closed by pressing the "clear light" button and then the red mechanical reset button.

Maintenance of intelligent release

- ◆ The intelligent release shall be operated carefully as required.

- ◆ M-type and H-type intelligent release shall be sealed with protective cover after setting or testing.

- ◇ Regularly check the fastening condition of each connection part, and timely tighten it in case of looseness.

- ◆ The ambient temperature and humidity at place of use must comply with relevant regulations.

- ◆ In order to ensure the accurate and reliable protection in case of line failure, the intelligent release shall be tested regularly. See 9.2.2 and 9.32 for the test methods.

Attention

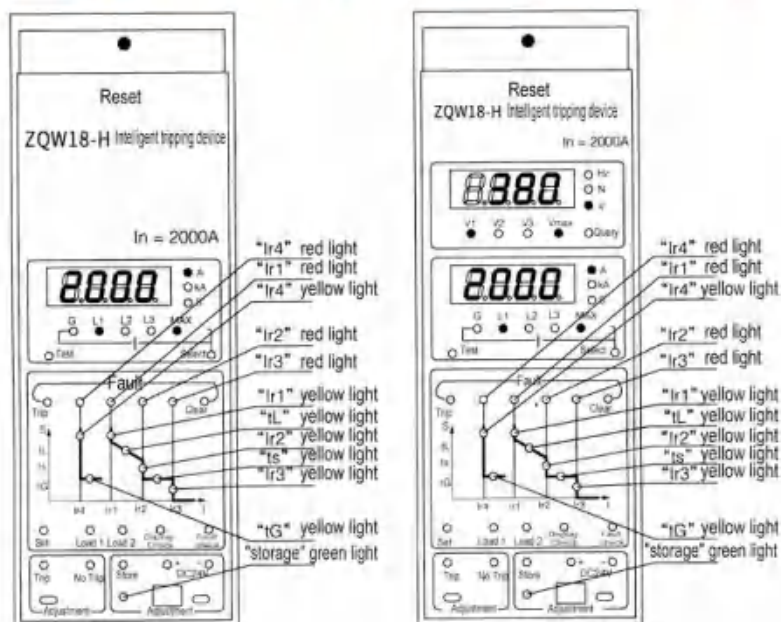
- ① During installation and commissioning, please protect the controller against dust, moisture and mechanical damage.

- ② When resetting the parameters, the current setting values of the three sections of protection shall not be cross set. It is required that $I_{r1} < I_{r2} < I_{r3}$.

- ③ Before putting into operation, professionals shall check whether the set parameters are correct, whether the controller has been reset with the light off, and whether the circuit breaker has entered the normal state, and conduct tests. During operation, the operator shall be diligent in observation, and timely handle any fault or abnormality found.

- ④ After the fault trip, the power grid fault can be put into operation again after the cause of the power grid fault is eliminated according to the information displayed on the panel.

Panel diagram of intelligent release and specific positions of various color indicators



Panel diagram of m-type and h-type intelligent release
(without voltmeter display)

Panel diagram of m-type and h-type intelligent release
(with voltmeter display)

ZQW18 Intelligent universal circuit breaker

Function description of keys and indicator lights of M-type intelligent release

Serial number	Name	Function
1	"Reset" red button	After tripping and breaking of the circuit breaker, it is necessary to press this button to close the circuit breaker again.
2	"Select" key	Select the displayed quantity in various states or categories such as setting, test and inspection.
3	"Clear l" key	Press this button to reset the intelligent release and to the operating state.
4	"Set" key	Press this key to cyclically display the setting current or delay action time of various protection characteristics.
5	"Display Check" key	This key is used for the inspection of light emitting devices. Press this key to light up all light emitting devices at the same time.
6	"Fault check" key	Press this key to display the previous line fault status and data memorized by the system.
7	"Trip" key Press this key	Conduct the tripping test, and the tripping action will occur after the test.
8	"No Trip" key Press this key	Conduct non tripping test, and no tripping action will occur after the test.
9	"Store" key Press this key	Then the current setting current or action time is stored as the setting value of its operation.
10	"+" "-" key	Used to increase or decrease the displayed value during setting.
11	"A" indicator lamp	When the displayed value is the current value and the unit is ampere (A), the green light will be on.
12	"kA" indicator lamp	When the displayed value is the current value and the unit is kiloampere (kA), the green light is on.
13	"S" indicator	When the displayed value is time value, the green light is on for seconds (s).
14	"L1", "L2" and "L3" indicators	The green light of a phase indicates that the current displayed is the current value of the phase.
15	"MAX" indicator lamp	The green light indicates that the displayed current value of this phase is the maximum value of the three-phase.
16	"g" indicator lamp	1. When the green light is constantly on, it indicates that the displayed current is the actual current value of asymmetric grounding (neutral connection) fault protection. 2. When the green light flashes, it indicates that the displayed value is the measured value of harmonic influence coefficient K.
17	"Test" indicator lamp	The yellow light indicates that the intelligent release is in the test state.
18	"Trip" indicator lamp	The red light indicates that the intelligent release has generated tripping action to break the circuit breaker.
19	"Load 1" indicator lamp	1. During the setting process, the yellow light on indicates that the load I current ILc1 is being set. 2. During the test, the yellow light flashes indicating that the load I monitoring test is in the delay state. When the light changes from flashing to long light, indicating that the test delay action time has expired. 3. In actual operation, the flashing yellow light indicates that the load 1 monitoring is in the delay state. When the flashing light changes to long light, it indicates that the delay action time has expired and the relay signal of cutting off load I has been sent.

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Function description of keys and indicator lights of H-type intelligent release

Serial number	Name	Function
20	"Load 2" indicator	1. During the setting process, the yellow light indicates that the load 2 current c_2 is being set. 2. During the test, the yellow light flashing board indicates that the load 2 monitoring test is in the delay state. When the flashing changes to long light, it indicates that the test delay action time has expired. 3. In the actual operation, the yellow light flashing indicates that the load 2 monitoring is in the delay state. When the flash changes to long light, it indicates that delay action time has expired and the corresponding relay signal has been sent.
21	"Ir4" red light	This red light indicates that the actual (or test) protection action is caused by the asymmetric grounding (zero connection) fault.
22	"Ir1" red light	This red light indicates that the actual (or test) protection action is caused by the overload long time delay.
23	"Ir2" red light	This red light indicates that the actual (or test) protection action is caused by the short circuit short time delay.
24	"Ir3" yellow light	This red light indicates that the actual (or test) protection action is caused by short circuit instantaneously.
25	"Ir4" yellow light	1. During the setting process, the yellow light on indicates that the asymmetric grounding (zero connection) fault current Ird is being set. 2. In actual operation, the flashing yellow light indicates that the asymmetric grounding (neutral connection) fault protection is alarming (not tripping).
26	"tG" yellow light	1. When the yellow light flashes, it means that the harmonic influence coefficient K is being set. 2. When this yellow light is constantly on, it means that the action time t_c of asymmetric grounding (zero connection) fault protection is being set.
27	"tL" yellow light	The yellow light on indicates that the action time t_L of overload long time-delay protection is being set.
28	"Ir1" yellow light	1. During the setting process, the yellow light on indicates that the overload long time-delay protection current Ir1 is being set. 2. During the test, the yellow light flashes, indicating that the overload long-time delay protection test is in the time-delay state. 3. In actual operation, the flashing yellow light indicates that the overload long delay protection of the line being processed is still in the delay state.
29	"Ir2" yellow light	1. During the setting process, the yellow light on indicates that the short-circuit short delay protection current Ir2 is being set. 2. During the test, the yellow light flashes, indicating that the short-circuit short delay protection test is in the delay state. 3. During the actual operation, the yellow light flashes, indicating that the short-circuit and short delay protection of the line is being processed, and the protection is still in the delay state.
30	"ts" yellow light	The yellow light is on, indicating that the action time t_s of short-circuit short time delay protection is being set.
31	"Ir3" yellow light	The yellow light is on, indicating that the short circuit instantaneous protection current Ir3 is being set.
32	"storage" green light	This green light is on and off again, indicating that the current adjusted current or action time value has been stored as the corresponding setting value.
33	"Query" key	Press this key to query the line voltage, phase voltage and frequency.
34	"V" indicator light	When this green light is on, it means that the value displayed in the voltmeter window is the voltage value in volts (V).
35	"N" indicator light	When this green light is on, it means that the value displayed in the voltmeter window is the phase voltage value.
36	"V1", "M2" and "V3" indicators	1. When a green light is on and the "V" green light is on, it means that the voltage displayed in the voltmeter window is the line voltage value. 2. When a green light is on and the "V" green light and the "N" light are on at the same time, indicating that the voltage value displayed in the voltmeter window is the phase voltage value.
37	The Vmax indicator light	When this green light is on, it means that the line voltage displayed in the voltmeter window is the maximum value of the three line voltages.
38	"Hz" indicator lamp	When this green light is on, it means that the value displayed in the voltmeter window is the frequency value. The unit is Hz.



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Product introduction

ZW18-H intelligent controller (hereinafter referred to as "intelligent controller") is a new generation intelligent controller with LCD Chinese display interface newly developed by our company. Its hardware and software are improved and optimized on the basis of ZQW18-M intelligent controller. It inherits the mature and stable kernel of ZQW18-M intelligent controller, and has made a lot of improvements in the power supply and display parts, reducing the power consumption of the whole machine, further improving the reliability and increasing the voltage protection function.

Basic functions of products

Protection and monitoring functions	Measuring function	Maintenance function	Human machine interface
Short circuit instantaneous protection Short time-delay definite-time protection Multi-curve short time-delay inverse time protection Multi-curve long time-delay protection Current imbalance protection Asymmetric grounding protection (vector sum type) Neutral phase protection MCR and HSISC protection Load monitoring (mode 1) undervoltage protection Overvoltage protection Voltage imbalance protection	Three (four) phase current Asymmetric grounding current Long time delay thermal capacity Internal temperature Phase and line voltage Voltage imbalance frequency phase sequence power power factor current waveform network harmonic influence coefficient	Eight fault records Eight alarm records Eight displacement records Main contact wear equivalent Operation times Tripping times System clock Fault self-diagnosis disconnection self-diagnosis	Chinese graphic LCD display LED status indication keyboard operation

Product co-selection function

Optional function	description of active energy	remarks
1. Communication function (H type)	The communication function is added, on the basis of M type intelligent controller, which contains the Modbus-RTU communication protocol. Profibus-DP or DeviceNet protocol conversion module can be connected externally, and the module can realize the remote communication function under a variety of open communication protocols.	
2. Four group of contact output functions	The intelligent controller contains four groups of passive contacts and the contact function is programmable.	This function is a necessary function in case of H typ.
3. Use KST programmer	KST programmer can be used on DB9 interface of the panel.	
4. Leakage protection function	The electronic devices for leakage protection are added in the intelligent controller, and the leakage zero sequence transformer is added to protect or alarm the leakage current. Implement current protection or alarm.	The asymmetric grounding protection function is automatically canceled.
5. Other protection	There are under frequency, over frequency and phase sequence protection or alarm respectively.	
6. Required value measurement and protection	Measure the practical value of required current. The maximum value can protect the required current or alarm.	



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Comparison table of symbols and their meanings

Serial number	Name	Function
1	Inm	Indicates the maximum rated current of the corresponding circuit breaker shell frame.
2	1^{Δ}	Indicates the rated current of circuit breaker.
3	In	Represents the rated current of the external leakage transformer respectively
4	Ir Is ISD li	Respectively representing the long time delay, short time delay inverse time limit and fixed time limit and the instantaneous setting current value.
5	IG	represents the asymmetric grounding or leakage setting current value.
6	Iav Uav	Represents the three-phase current respectively, and the average value of the three line voltages.
7	Ic1 Ic2	Represents the load monitoring 1, load monitoring, 2 current setting value
8	8I 8V	Indicates current imbalance rate and voltage imbalance rate, respectively
9	tr ts tsD	Represents long time delay, short time delay inverse time limit and definite time limit setting time value.
10	tG t8	Represents asymmetric grounding or leakage respectively, and unbalanced setting time value.
11	KG	represents asymmetric grounding or leakage protection inverse time limit coefficient 1
12	N	1. For 4-pole products, it represents N-phase setting value 2. Express 1/1r in the overload inverse time characteristic expression.
13	Uan Ubn Ucn	represent three phase voltages respectively
14	Uab Ubc Uca	represent three line voltages respectively
15	Ia Ib Ic IN	represent four phase currents of A, B, C, and N respectively.

Product introduction

The function description of ZQW18-h intelligent controller

◇ Protection function

The protection function can record the tripping of a protection and the detailed parameters, date and time of tripping can be obtained through information inquiry.

◇ Overload long time delay protection feature

power distribution or click protection	Setting current value	Ir=Inx ...	0.4 ~ 1.0+OFF(exit position)
		Action characteristics	$\leq 1.05 I_r > 2h$ no action $> 1.30 I_r < 1h$ action
	Time delay Setting value tr (3) (corresponding to $\pm 51r$)	characteristic curve	Curve 1 ~ Curve 6 (adjustable) is set as curve 3 when leaving the factory.
		Curve rate	IEC60255 standard has 80 adjustable points.
		precision	$\pm 10\%$
Generator protection	Setting current value	Ir=Inx ...	0.4 ~ 1.0+OFF(exit position)
		Action characteristics	$\leq 1.05 I_r > 2h$ no action $> 1.30 I_r < 1h$ action
	Inverse time delay Setting value tr (3) Y (corresponding to ten 51r)	characteristic curve	Curve 1 ~ Curve 6 (adjustable) is set as curve 3 when leaving the factory.
		Curve rate	IEC60255 standard has 80 adjustable grade points.
N-phase protection	precision		$\pm 10\%$
	Setting coefficient (note)		25% or 50% (applicable to 3P+N or 4P products)
Action characteristics		Same as A, B and C three-phase protection characteristics	
Thermal memory (can be cleared after 30min power failure)		Standard +OFF (off)	

Note: When the setting coefficient of N-phase protection is 50%, the setting value of N-phase protection is 50% of A, B and C phases. If the setting setting current value of overload long delay is 1600A, the setting current value of N-phase protection is 800A.

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Inverse time delay setting value of six overload protection characteristic curves

The intelligent controller provides six kinds of overload protection characteristic curves, which are expressed as follows

-SI standard inverse time limit	$T=0.00814t/(N-1)$
-VI fast inverse time limit	$T=0.5t/(N-1)$
-EI(G) fast inverse time limit (general purpose)	$T=1.25t/(N-1)$
-EI(M) fast inverse time limit (motor protection)	$T=1.3974t \cdot \ln(N/(N-1.15))$
-HV high-voltage fuse compatible	$T=4.0625t/(N-1)$
-It fast inverse time limit 2 (general purpose)	$T=2.25t/$
That is	$T=t^*(1.5I_r/r)$

In which T is the actual protection delay action time value t is the inverse time delay setting value. The inverse time delay setting value of each characteristic curve is shown in table 15, N is the ratio of actual working current to the setting current value of overload long time delay protection, that is,

number	The inverse time delay setting value t(s) of the overload protection characteristic curve					
	corresponds to the delay action time at d 1.5I _r					
	SI standard inverse time curve 1	VI fast inverse time Curve 2	EI (G) super fast inverse time (general purpose) curve 3	EI (M) super fast inverse time (motor protection) curve 4	Hv high-voltage fuse compatibility Curve 5	I ² tsuper fast inverse time 2 (general purpose) curve 6
C01	0.62	2.00	8.00	6.24	2.48	15.00
C02	1.00	3.20	12.80	9.98	3.94	20.00
C03	1.48	4.80	19.20	14.96	5.92	25.00
C04	2.48	8.00	32.00	24.92	9.86	30.00
C05	3.70	12.00	48.00	37.36	14.78	40.00
C06	4.94	16.00	64.00	49.82	19.70	50.00
C07	6.16	20.00	80.00	62.28	24.62	60.00
C08	9.24	27.00	108.00	84.06	33.24	80.00
C09	11.10	36.00	144.00	112.00	44.32	125.00
C10	17.26	56.00	224.00	174.30	68.94	120.00
C11	24.64	80.00	320.00	249.00	98.48	160.00
C12	36.96	120.00	480.00	373.60	147.70	200.00
C13	48.28	160.00	640.00	498.10	196.90	240.00
C14	61.60	200.00	800.00	622.60	246.10	320.00
C15	73.92	240.00	960.00	747.20	295.40	400.00
C16	86.24	280.00	1040.00	809.40	320.00	480.00

Technical parameters of short-circuit short time-7delay protection characteristics

Example of calculation

If the setting condition of the long delay protection of an intelligent controller is, the characteristic curve of overload long delay protection is curve 3, I_r is 2000A, and t_r is 48.00s, calculate the overload long delay action time T_r when the actual fault current is 4000A.

$$N=I/I_r=4000/2000=2.0$$

$$T_r=1.25 t_r / (N^2-1)=1.25 \times 48 / (2.0^2-1)=20 \text{ s}$$

That is, the overload long delay action time under this condition is 20 seconds.

Note: When the short circuit short delay definite time protection is put into operation, the delay action time of the overload long delay is not less than the setting value of the short circuit short delay definite time protection. If the short circuit short delay definite time protection is in the exit state, the delay action time of the overload long delay is not subject to this limit (but not less than 20ms).

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Inverse time setting current value	$I_s=I_r \dots$	1.5~15+OFF (exit position)
	Action characteristics	$\leq 0.9I_s$ does no action $> 1.1I_s$ delay action
Definite time setting current value	$I_s=I_r \dots$	1.5~15+OFF(exit position)
	Action characteristics	$< 0.9I_s$ does no action $> 1.1I_s$ delay action
Definite time delay setting value t_{SD}	$t_{SD} (s)$	0.1~1 (level difference 0.1)
	Accuracy	$\pm 10\%$
Inverse time protection characteristic		Curves 1~5 is the same as the curve with long overload delay but 10 times faster curve 6
Inverse time thermal memory (15min power-off shell clearing)		characteristic expression $T_s=64t_{SD}/N^2$, that is, $T_s=t_{SD} \cdot (8I_r/I)^2$
		Standard +OFF (close)

Technical parameters of short-circuit instantaneous protection characteristics

There are two modes of short-circuit delay protection:

1. Inverse time protection, when the fault current exceeds the inverse time setting current value, if it is curve (1~5), the intelligent controller will perform delay protection according to the same curve (1~5) as the overload long time delay. Only the speed of protection is 10 times faster (that is, one tenth of the delay action time calculated according to the overload long delay curve expression). If it is curve 6, the inverse time delay action time value is calculated according to the characteristic expression of short circuit short delay curve 6.
2. Definite time limit protection, when the fault current exceeds the set current value of the definite time limit, the intelligent controller will perform delay protection according to the set value of the definite time limit delay.

Examples of calculation

If the setting condition of the long time delay protection of an intelligent controller is that the characteristic curve of overload long time-delay protection is curve 3, I_r is 2000A, t_r is 48.00s, and the setting conditions of the short time-delay protection is that I_S 3000A, I_{SD} is 5000A, and the actual fault current is 4000A, the intelligent controller will act in the short time-delay inverse time limit. At this time, $T_r=20s$ calculated by the formula then the action time $T_s=T_r/10=2$ seconds.

Note: when the inverse time setting current value is set at the "OFF" position or the definite time setting current value is less than or equal to the inverse time setting current value, the intelligent controller will protect according to the definite time limit, and the inverse time function will automatically fail. When the definite time limit protection is put into operation, the delay action time of either the definite time limit protection or the inverse time limit protection and the short time delay protection will not be less than the definite time delay setting value. If the definite time limit protection is in the exit state. The delay action time of the inverse time protection is not limited by the setting value of definite time delay (but not less than 20ms)

Setting current value	$I_i=$	1.0 I_n ~50kA/75kA/125kA+OFF (exit position) (note)
	Action characteristic	$\leq 0.85I_i$ does not act $> 1.15I_i$ acts
actuation time		$< 125ms$ (including inherent analysis time of circuit breaker)

Note: when the intelligent controller is frame I, the setting current value of instantaneous protection is 1.0 I_n ~50kA+OFF; when the intelligent the controller is frame II, the setting current value of instantaneous protection is 1.0 I_n ~75kA+OFF; When the intelligent controller is frame III, the setting current value of instantaneous protection is 1.0 I_n ~125kA+OFF.

Technical parameters of asymmetric grounding or leakage protection characteristics

- ◇ Asymmetric grounding or leakage protection characteristics
- ◇ Asymmetric grounding protection of intelligent controller has two protection modes ,namely,vector sum (difference) type (T) and ground current type (W). T-type zero detects zero sequence current , that is, the vector sum of four-phase (three-phase four wire system) or three phase (three-phase three wire system) current is taken for protection. T type W directly detects the current on the grounding cable through a special external transformer for protection.
- ◇ The leakage protection signal of the intelligent controller is directly taken from the external zero sequence transformer, and the actual current value of the leakage protection is directly represented by the secondary current of the zero sequence transformer, independent of the rated current of the circuit breaker.

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Asymmetric grounding protection	Setting current value	$IG=I_{nx}\cdots$	0.2~1+OFF (minimum 125A OFF indicates the exit position)
		Action characteristic	$< 0.8IG$ does not act $\geq 1.0IG$ delay action
	T-type harmonic influence coefficient setting value	Harmonic influence coefficient k	ON+10%~125%+OFF (level difference 1%) (Note)
	Delay setting value	definite time delay tG(s)	0.1~1+OFF (level difference of 0.1 OFF means that only the alarm is completed without tripping)
		Inverse time coefficient KG	1.5~6+OFF (level difference of 0.5 OFF indicates that grounding is a fixed time limit)
		Accuracy	$\pm 10\%$
leakage protection	Setting current value	$IG=I_{\Delta x}\cdots$	0.2~1+OFF (minimum 125A OFF indicates the exit position)
		Action characteristic	$< 0.8IG$ does not act $\geq 1.0IG$ delay action
	De lay setting value	definite time delay tG(s)	0.1~1+OFF (level difference of 0.1 OFF means that only the alarm is completed without tripping)
		Inverse time coefficient KG	1.5~6+OFF (step difference of 0.5 OFF indicates that grounding is a fixed time limit)
		Accuracy	$\pm 15\%$

Note: The setting term K of harmonic influence coefficient (i.e., the comprehensive coefficient of harmonic influence on the sum of three-phase analog current vectors) is added to the T-type asymmetric grounding protection. When K is set at "OFF", the asymmetric grounding protection adopts three-phase current analog vector sum value for protection. When K is set at "ON", the asymmetric grounding protection adopts three-phase current digital vector sum value for protection. When K is set at 10%~125%, the asymmetric grounding protection includes the harmonic influence program of this percentage as the actual grounding current value for protection. Three-phase current analog vector sum value is adopted for protection. When k is set to "ON", all asymmetric grounding protection is protected by digital vector sum value of three-phase current. When k is set to 10% ~ 125%, the percentage of harmonic influence program of asymmetric grounding protection is included as the actual grounding current value for protection.

Technical parameters of current imbalance protection characteristics

There is only one choice between asymmetric grounding protection and leakage protection.

There are two ways of asymmetric grounding protection or leakage protection.

the inverse time limit protection The expression of protection characteristic of inverse time-limit protection is $TG = TG \cdot kg \cdot 7G8$.

In the eighth formula, TG is the actual protection delay action time value.

tG is the definite time delay setting value

KG is the inverse time coefficient value

IG is the setting current value

I is the actual working current

The inverse time protection delay action time is calculated according to the above expression, but the inverse time protection delay action time is not less than the definite time delay setting value. If KG is OFF, it is time limit protection. Definit time limit protection, the delay action time of definite time limit protection is the definite time delay setting value.

Current unbalance protection feature

The intelligent controller's current imbalance protection is to protect the open phase and three-phase current imbalance, and to perform protection action or alarm according to the imbalance rate between the three-phase currents.

The calculation formula of current unbalance rate is

$$\delta I = I_{\Delta} / I_{av}$$

In the formula, I_{av} is the average value of three-phase current

The current imbalance protection feature is time limit protection, and the delay setting value is t6. When ts is "OFF", it means that the current imbalance protection only gives an alarms and does not trip.

Starting value of current unbalance rate	I_{Δ}	40%~125%+OFF (level difference 1% OFF indicates the exit position)
	Action characteristic	≤ 0.98 No action > 1.18 Delay action
Delay setting value	t (s)	0.1~1+OFF (level difference of 0.1 OFF means that only the alarm and no trip)
Accuracy	δ	$\pm 10\%$

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Technical parameters of load monitoring protection characteristics

Load monitoring protection characteristics

See Table 20 for technical parameters of load monitoring protection characteristics of intelligent controller.

The intelligent controller can be programmed to output two passive signal contacts for load monitoring. The output signal contacts can be used for monitoring and alarm, and can also be used to control the load of the breaking branch and ensure the normal power supply of the main system.

There are two load monitoring methods to choose from (users can choose one of them).

Mode 1: One is to control two branches loads. When the running current exceeds $1.2I_{c1}$ or $1.2I_{c2}$, the intelligent controller will delay the output of signal contacts according to the inverse time characteristic. The inverse time characteristic curve is the same as the overload long delay, but the curve rate and the setting current value can be set adjusted separately.

Mode 2: Generally, it is used to control the branch load. When the running current exceeds $1.2I_{c1}$, the intelligent controller outputs a signal contact to break the branch load according to the inverse time characteristic delay. The inverse time characteristic curve is the same as the overload long delay, but the curve rate and setting current value can be set independently. The setting value $I_{c1} > I_{c2}$ is required. If the running current returns to normal after braking the branch load, when the current value is lower than the setting value I_{c2} and lasts for 60s, the intelligent controller will output another signal contact to connect the power supply of the broken load recovery system.

Technical parameters of short-circuit delay protection characteristics

Mode 1	Setting current value	Ic1=Inx ...	0.2~1+OFF (minimum 125A OFF indicates the exit position)
		Output characteristic	≤ 1.05Ic1 relay does not close.
			> 1.2 Ic1 relay delay closing
	Inverse time delay setting value (s)	Characteristic curve	Same as the load length delay characteristic curve
		Curve rate	Independent setting (setting parameters are the same as overload long delay)
	Setting current value	Ic2=Inx ...	0.2~1+OFF (minimum 125A OFF indicates the exit position)
		Output characteristic	≤ 1.05Ic2 Relay does not close
			>1. 2 Ic2 Relay delay closing
Mode 2	Inverse time delay setting value (s)	Characteristic curve	Same as the load length delay characteristic curve
		Curve rate	Independent setting (setting parameters are the same as overload and long delay)
	Setting current value	Ic1=Inx ...	0.2~1+OFF (minimum 125A OFF indicates the exit position)
		Output characteristic	≤ 1.05Ic1 relay does not close
			> 1.2 Ic1 relay delay closing
	Inverse time delay setting value (s)	Characteristic curve	Same as the load length delay characteristic curve
		Curve rate	Independent setting (setting parameters are the same as overload and long delay)
	Setting current value	Ic2=Inx ...	0.2~1+OFF (minimum 125A OFF indicates the exit position)
		Output characteristic	< Ic2 relay delayed closing
	Fixed delay (s)		
Precision			±10%
Thermal memory (can be cleared after 30min power failure)			Standard +OFF (off)

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Technical parameters of undervoltage protection characteristics

The intelligent controller measures the true effective value of the primary circuit voltage. When the three line voltages are all less than the undervoltage starting value (that is, when the maximum value of the three line voltages is less than the undervoltage protection starting value), the undervoltage protection acts. When the maximum value of the three line voltages is greater than the return value, the alarm acts and returns. When the power failure instantaneous function is enabled, the undervoltage protection will actuate the break in case of power failure.

Undervoltage protection starting value	Setting range (v)	25 ~ 1200 (level difference 1)
	Action or alarm feature	$> 1.1 \times$ startup value does not act or alarm. $\leq 0.9 \times$ startup value delay action or alarm
Start delay time value	Setting range (v)	0.2 ~ 60 (level difference 0.1)
Undervoltage alarm return value	Setting range (v)	Start-up value ~ 1200 (level difference 1)
	Alarm characteristics	$< 0.9 \times$ return value alarm does not return $\geq 1.1 \times$ return value alarm and return
Return delay time value	Setting range (v)	0.2 ~ 60 (level difference 0.1)
precision		$\pm 10\%$
Protection execution time		Alarm/Trip/Shutdown

Technical parameters of overvoltage protection characteristics

The intelligent controller measures the true effective value of the primary circuit voltage. When the three line voltages are all less than the undervoltage starting value (that is, when the maximum value of the three line voltages is less than the undervoltage protection starting value), the undervoltage protection acts. When the maximum value of the three line voltages is greater than the return value, the alarm acts and returns. When the power failure instantaneous function is enabled, the undervoltage protection will actuate the break in case of power failure.

Undervoltage protection starting value	Setting range (v)	125 ~ 1200 (level difference 1)
	Action or alarm feature	$> 0.9 \times$ startup value does not act or alarm $\leq 1.1 \times$ startup value delay action or alarm
Start delay time value	Setting range (s)	0.2 ~ 60 (level difference 0.1)
Undervoltage alarm return value	Setting range (v)	Start-up value ~ 1200 (level difference 1)
	Alarm characteristics	$< 0.9 \times$ return value alarm does not return $\geq 1.1 \times$ return value alarm and return
Return delay time value	Setting range (s)	0.2 ~ 60 (level difference 0.1)
Precision		$\pm 10\%$
Protection execution time		Alarm/Trip/Shutdown

Technical parameters of voltage imbalance protection characteristics

Voltage imbalance protection characteristics

The voltage imbalance protection of intelligent controller is based on the imbalance rate of three line voltages for protect action, and its action mechanism is similar to the overvoltage protection.

The calculation formula of voltage imbalance is $8v = U_{av} / U_{av}$.

In the formula, U_{av} is the average of the three line voltages.

Voltage imbalance protection startup value	Setting range (v)	2%~30%(level difference 1%)
	action or alarm feature	$< 0.9 \times$ startup value does not act or alarm $\geq 1.1 \times$ startup value delay action or alarm
Startup delay time value	Setting range (s)	0.2 ~ 60 (level difference 0.1)
Voltage imbalance alarm return value	Setting range (v)	2%~30%(level difference 1%)
	Alarm characteristics	$> 1.1 \times$ return value alarm does not return $\leq 0.9 \times$ return value alarm returns
Return delay time value	Specified range (s)	0.2 ~ 60 (level difference 0.1)
Precision		$\pm 10\%$
Protection execution mode		Alarm/Trip/Shutdown

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MCR (on/off) and TTSISC (out-of-limit tripping) protection functions

The make break and trip out of limit protection of the intelligent controller are backup protection functions. The two protection modes are instantaneous actions, and the action value is generally 40kA, 60kA, 80kA, and the making breaking current value related to the operation breaking and limit breaking capacity of the circuit breaker is generally 50kA, 75kA and 125kA (two current values are 40/50kA for frame I, 60/75 kA for frame II, 80/125kA for frame III when they leave the factory). The fault current signal sends the action command directly through the hardware comparison circuit. The switching on-off protection only works at the moment when the circuit breaker switched on (within about 125ms), while the out of limit tripping protection always works after 125ms of switch on.

Measurement function

Real-time value measurement

◇ Current value

Measurement method

Measure the true effective value (RMS) of each phase current. The measurement items include phase A current Ia, phase B current Ib, phase C current Ic, phase N current IN, ground fault current or leakage current Ig.

Measuring range

Phase A current Ia, phase B current Ib, phase C current Ic and phase N current IN shall not be less than 25 times of the rated current IN, and ground fault current or leakage current Ig shall not be less than 10 times of rated value.

◇ Measurement accuracy

The error of 7mk within the range of 2 times of the rated current IN is $\pm 1.5\%$, and the error is $\pm 5\%$ when the rated current IN is more than 2 times.

◇ Column graph display of current

During operation, the intelligent controller displays the current values of phases A, B, C and (or N) in a column-figure, and displays the maximum phase current in figures. The height (percentage) of the column graph indicates the percentage between the current value of each phase and the setting current value of the overload long time-delay protection (the rated current value when the overload long time-delay protection is closed).

◇ Current imbalance rate value

The current imbalance rate is the percentage of imbalance between the measured three-phase currents. The calculation formula of current imbalance rate is $8I = I-I_{av}/I_{av}$.

Where I_{av} is the average value of three-phase current.

◇ Voltage value

Measurement method

Measure the true effective value (RMS) of each phase voltage

Measuring range

Line voltage (voltage between phase lines) 0V ~ 1200V

Phase voltage (voltage between phase line and neutral line) 0V ~ 600V.

◇ Measurement accuracy

$\pm 0.5\%$

◇ Phase sequence

Display three-phase voltage phase in the form of "A-B-C" and "A-C-B"

◇ Frequency

Measurement range

45Hz ~ 65Hz

Measurement accuracy

$\pm 0.05\text{Hz}$

Note: The frequency signal is taken from phase A voltage.

◇ Voltage unevenness value

The voltage imbalance rate is the percentage of imbalance between three line voltages. The calculation formula of voltage imbalance rate is $6V = U-U_{av}/U_{av}$

Where U_{av} is the average of three line voltages.

◇ Active power

Measurement content

Phase A active power

Measurement accuracy

$\pm 2.5\text{Hz}$

◇ Power factor

Measurement content

◇ Phase A power factor

Measurement accuracy

± 0.02

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Measurement function

- ◇ Harmonic influence coefficient measurement
Harmonic influence coefficient (i.e. the comprehensive coefficient of grid harmonics affecting the sum of three-phase current analog vectors) is the program that represents the impact of grid harmonics on T-type grounding protection. The calculation formula of measured value of harmonic influence coefficient is $K = (I_{AG} - I_{DG}) / I_z \times 125\%$
In the formula I_{AG} is three-phase current analog vector and value
In the formula I_{DG} is three-phase current analog vectors and value
In the formula I_z is asymmetric grounding comprehensive current value
- ◇ Internal temperature measurement
Internal temperature refers to the small ambient temperature value near the internal microcontroller (MCU) of the intelligent controller, which is measured in real time with a temperature chip.
When the temperature exceeds $85\text{ }^{\circ}\text{C} + 5\text{ }^{\circ}\text{C}$, the system will give an alarm of internal environment over temperature alarm.
- ◇ System setting function
- ◇ System clock function
The system clock function is the basic configuration function of ZQW18-3 intelligent controller. The intelligent controller is equipped with a 3V lithium battery. As long as the lithium battery is powered, the system clock will not reset due to external power failure.
- ◇ Meter setting function
- ◇ System type selection
There are three types of systems.
-3 3W3CT
System type three phase three wire system
Number of poles of circuit breaker three poles (3P)-3 4W3CT
System type three phase four wire system
Number of poles of circuit breaker three poles (3P)
-3 4W4CT
System type three phase four wire system
Number of poles of circuit breaker four poles (4P) or three poles plus N poles (3P+N).
- ◇ Internal temperature calibration
The internal temperature calibration shall be carried out when the intelligent controller is cold, and the internal temperature is close to the external ambient temperature. The internal temperature has been calibrated when the intelligent controller leaves the factory, and users generally don't need to calibrate it.
- ◇ Communication switching
Model 3H intelligent controller or added the function of "using KST programmer" KsT can be used on the DB9 interface of panel of 3M intelligent controller programmer
There are two options for communication switching.
There are two options for communication switching.
Communication with upper computer.
Only when "Communication with Programmer" is selected can all the functions of KsT programmer be exerted.
The RS485 interface of 10# and 11# lines of 3H intelligent controller is the same as the RS485 interface of the panel. (i.e. interlinked).
- ◇ Test & lock function

Technical parameters of simulation test

- ◇ Simulation test
There are three types of simulation tests.
The three section protection test adjusts the test current (equivalent to the fault current) and starts the test to simulate the protection of the intelligent controller when the overload long delay, short circuit short delay and short circuit instantaneous faults occur. Grounding or leakage protection test, adjust the test current (equivalent to the grounding or leakage fault current) and start the test to simulate the protection of intelligent controller when grounding or leakage fault occurs.
Mechanism action time test: after the startup test, the system forces the magnetic flux converter to act to test the mechanical action time of the circuit breaker tripping.
There are two types of simulation tests.
No tripping test: when the test is completed, the intelligent controller displays the test result information without tripping. This test type is applicable to the on-site simulation test without power failure.
Tripping test: when the test is completed, the intelligent controller displays the test result information and trips. This test type is applicable to the simulation test that can be powered of.

Test type	Three section protection	Grounding or leakage protection		Mechanism action time
		Asymmetric grounding protection	leakage protection	
Test form	No tripping/tripping			releasing
Test current	0A-50kA (frame I)/75kA (frame II)/125a K (frame III)		0A-99.99A	without
Test control	Start/stop			

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Limitation of position locking on operation.

◇ Position locking

The position locking of the intelligent controller has three states: setting, local and remote control.

Starting value of voltage unbalance protection	Position locked state		
	set up	local	remote control
Remote control and remote adjustment	cannot	cannot	can
Local parameter adjustment	can	cannot	cannot
Local test	can	cannot	cannot
Programmer operation	can	can	can

Technical parameters of communication settings

◇ Parameter locking

There are two states for parameter locking of intelligent controller.

When the parameter is locked in this state, the user can only query the parameter and can not modify it.

When the parameter is unlocked in this state, the users can query and modify the parameters.

Note: In order to prevent all parameters of the intelligent controller from being modified without authorization and ensure reliable operation of the system, the parameter locking function implements user password management. When entering this function, you need to correctly enter the user password.

◇ Communication setting function

The model 3H intelligent controller can realize the "four remote" functions such as remote measurement, remote control, remote adjustment and remote signaling through the Rs485 interface (10#, 11# lines or DB9 interface on the panel). The communication interface adopts photoelectric isolation and is suitable for the environment with strong electrical interference.

Communication protocol	Modbus-RTU	Profibus-DP	DeviceNet
Communication module	Built-in	Appearance	
Communication address	0-255	3-126	0-63
Baud rate	9, 6k, 19, 2k	Self-adaption	125k, 250k, 500k

Signal contact output function and output schedule of intelligent controller

◇ I/O setting function

The 3H intelligent controller and the 3M intelligent controller added with "four groups of contact output functions" have four independent signal contact outputs, and their output functions can be set.

Function number	Signal contact output function	Signal contact output time
0	Undefined	No output
1	Short circuit instantaneous fault trip alarm	Output when short circuit transient fault trips
2	Grounding or leakage fault trip alarm	Output when grounding or leakage fault trips (or alarms)
3	Current imbalance fault trip alarm	Output when current imbalance fault trips (or alarms)
4	Short circuit short delay fault trip alarm	Output when short circuit short time delay fault trips
5	Overload long delay fault trip alarm	Output when overload long delay fault trips
6	Fault trip alarm	Output when any fault trips
7	Load monitoring -unloading output	Output when the load monitoring time I expires
8	load monitoring II unloading output	Output when the load monitoring time II expires
9	System self-diagnosis fault alarm	Output when system self-diagnosis failure
10(A)	Power grid fault pre-alarm	Output at the beginning of protection or monitoring delay
11(B)	Undervoltage fault alarm	Output when the start time of undervoltage fault alarm expires
12(C)	Overvoltage fault alarm	Output when the start time of overvoltage fault alarm expires
13(D)	Voltage imbalance fault alarm	Output when starting time of voltage imbalance fault alarm expires



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Limitation of position locking on operation

Contact number Controller type	Contact No.1	Contact No.2	Contact No.3	Contact No.4
Type 3M	Load monitoring I unloading output	Load monitoring II unloading output	System self-diagnosis fault alarm	Fault trip alarm
Type 3H	Load monitoring I unloading output	Load monitoring II unloading output	Remote opening	Remote closing

Note: The contact 3 and contact 4 of the 3H intelligent controller are fixed for remote opening and closing, which cannot be set to other functions.

All alarm information that can be displayed

◇ The query function

◇ Current report

When the "Fault/Alarm" red light flashes slowly, it means that the intelligent controller has alarm information. You can query the "Current Alarm" to display the current alarm information.

Category	Reported information
Self-diagnosis fault alarm	External memory error
	Analog digital conversion error
	Internal environment overtemperature
	A phase transformer disconnection
	B phase transformer disconnection
	C phase transformer disconnection
	N-phase transformer disconnection
	Flux converter disconnection
	Main contact wear
	Opening mechanism refuses to operate
Self-diagnosis serious fault alarm	program memory error (note)
Protection alarm	Grounding or leakage fault
	Current imbalance fault
	Undervoltage fault
	Overvoltage fault
	Voltage imbalance fault
	Fault pre-alarm

Note: When the intelligent controller displays the alarm of "program memory error", it means that the MCU of the intelligent controller has a serious fault. If the intelligent controller cannot work normally, it should be replaced in time.

◇ Number of operations

Cumulate the opening and closing times of the circuit breaker. This number will increase by 1 for one operation of the opening and closing. This value can be modified and cleared by special methods.

◇ Main contact worn

The intelligent controller simulates and calculates the wear rate of the main contact of the circuit breaker according to the fault current when tripping, the structure of main contact and other data. The display value of the intelligent controller when leaving the factory is 0%, indicating that the main contact is not worn. After each fault tripping, the intelligent controller automatically deducts the corresponding wear rate equivalent. When the display value of the wear rate is $\geq 40\%$, the system will send out a self diagnostic fault alarm signal to remind the users to take timely maintenance measures.

After the main contact is replaced, the initial wear rate value may be restored to 0% through programmer or special method.

◇ Product information

Displays the manufacturer information of the intelligent controller.



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◇ Trip record

Record the fault information and measurement parameters at the time of the last 8 fault trips.

Record the total number of fault trips. This value can be cleared in a special way.

The specific information of each fault trip record includes the fault time

(year, month, day, hour, minute, second)

Fault category (i.e. cause)

Fault source values (such as fault current value, fault voltage value, fault unbalance value, etc.)

Fault delay time

Fault phase

Total number of failures/this number

Measurement parameters at the time of failure

◇ Alarm record

Record the alarm information of the last 8 fault alarms.

The specific alarm information of each fault alarm record includes

Alarm reason

Alarm time (year, month, day, hour, minute, second)

Alarm source value (some alarm information do not have this item)

◇ Change record

Record the information of the last 8 times of the breaker mechanism opening and closing.

The specific information of each change is

Change type

Reason of change

Change time (year, month, day, hour, minute, second)

◇ Other functions

◇ Display inspection function

This function can check the working conditions of all light-emitting devices, ensure that the light-emitting devices indicate accurately, and display product information.

◇ Disconnection self diagnosis function

The intelligent controller can self diagnose three (four) phase air core transformer disconnection and magnetic flux converter disconnection faults.

◇ Thermal memory function

Repeated overloads may cause heating of conductors or equipment. The intelligent controller simulates the heating condition, and has a thermal effect (simulating bimetallic characteristics) after the overload long delay and short circuit short delay and other fault delay actions. The overload long time delay thermal effect is released 30 minutes after the fault is removed, and the short circuit short time delay thermal effect energy is released 15 minutes after the fault is removed. During this period, if the overload long time delay, short circuit short time delay and other fault occur when the circuit breaker is closed again, the delay action time will be shortened, which can enable the line or equipment to get more appropriate protection. (The thermal memory characteristics of load monitoring is the same as that of overload long time delay protection)

The overload long delay thermal memory is displayed through the "current heat capacity". When the "current heat capacity" reaches 125%, the overload long-delay protection acts.

For example if the intelligent controller is powered off once and then powered on, the accumulated thermal effect is completely eliminated.

This feature defaults to on when leaving the factory, which means it has the thermal memory function. Users can set this function by themselves.

◇ Programming interface function

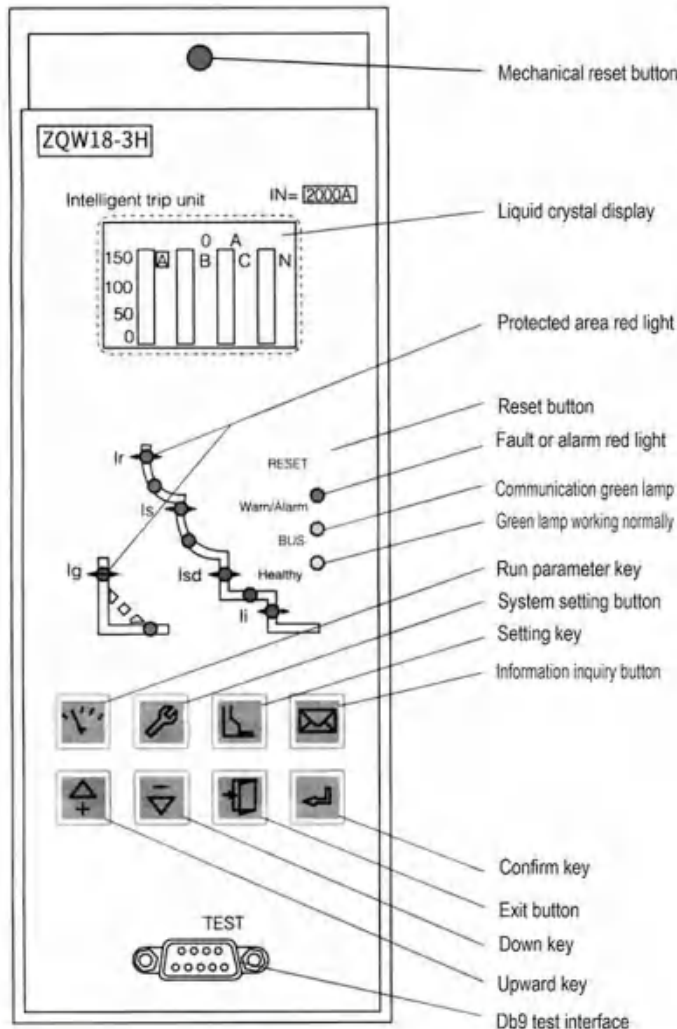
The 3H intelligent controller and the 3M intelligent controller added with the function of "using KST programmer" have the function of communicating with the programmer on Db9 and interface of the panel. Some internal parameters of the system can be set through the programmer, such as the selection of overload protection characteristic curve category, the opening and closing of thermal memory function, the setting of signal contact output function, the selection of communication protocol, the setting of communication address, the selection of communication baud rate, the calibration of system clock, the locking and unlocking of setting function, the selection of voltage wiring mode, etc. There are also functions such as testing opening and closing, viewing historical data and copying setting values.

For the use of the programmer, refer to the User Manual of the Programmer.

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Usage of ZQW18-3 intelligent controller

◇ Panel structure



Panel diagram

◇ Overview of panel composition, display and operation
The panel of ZW18-3 intelligent controller consists of five parts: LCD , LED indicator group, keyboard, DB9 test interface and red mechanical reset button. See the schematic diagram of the panel.

◇ LCD screen
LCD displays all measurement parameters, system setting parameters, protection setting parameters and all information in Chinese.

A When there is " ↓ " in the upper right corner of the LCD ,it indicates there is a next display interface. Press the key to go to the next interface.

A When there is " ↑ " in the upper right corner of the LCD ,it indicates there is a next display interface. Press the key to go to the previous interface.

When there is an " ↑ ↓ " upper and lower display interface in the upper right corner of the LCD screen, it means that there are display interfaces at the top and bottom.

Press the key to go to the previous interface and the key to go to the next interface.

Meaning of the flashing form of fault or alarm red light

◇ LED indicator group

Protection section red light

When setting the current protection , the red light of this section is always on, indicating that the protection current value or delay time value of the corresponding section is being set.

In case of fault delay or alarm, the red light in this section flashes at a constant speed (once a second), indicating that the corresponding section is in fault delay or alarm.

After the fault protection trips, the red light in this section flashes rapidly.(once every 0.4 seconds) , indicating the corresponding section is tripped due to fault.

Fault or alarm red light

Function of fault or alarm red light.

ZW18-3 "fault or alarm red light" integrates "fault pre-alarm", "fault trip" and "self-diagnosis fault alarm", and distinguishes fault information from alarm information by different flashing modes.

During normal operation , the fault or alarm red light does not light up, which means that as long as the "fault or alarm red light" flashes, there must be abnormal conditions in the system.

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Serial number	Red light status	Meaning
1	Slow flashing (once every 2 seconds)	The system alarm or self diagnosis fault information.
2	Constant speed flashing (once every second)	The protection is in the fault delay (pre-alarm) state.
3	Rapid flashing (once every 0.4 seconds)	The protection is in fault tripping state.

◇ Communication green light

The green communication light indicates the communication data transmission. The light is on when the communication data is transmitted, and off when no communication data is transmitted.

◇ Normal operation green light

The "normal working green light " always flashes when the intelligent controller is powered on. If the light doesn't light or remains on after power on, it means that the intelligent controller is not working properly and should be replaced immediately.

◇ Keyboard

The intelligent controller keyboard has four shortcut keys  (operation parameter key),  (system setting key),  (protection setting key) and  (information inquiry key), which can be quickly switched between the four main menus.

There are also five operation keys,

Specifically

 Quickly switch to the main menu of "Operating Parameters" ("Left key" when the system clock is calibrated).

 Quickly switch to the main menu of "System Settings" (it is the "Right key" when the system clock is calibrated).

Quickly switch to the "Protection Settings" main menu.

 Quickly switch to the main menu of "Information Inquiry".

 (Up) Move the cursor upward, or change the selected parameter upward, or position the display to the left.

 (Down) Move the cursor down, or change the selected parameter down, or position the display to the right.

 (Exit) Exit the current menu to enter the previous menu, or cancel the modification of the current parameters.

 (Confirm) Enter the next menu of the item indicated by the current cursor, or select the current parameter, or store the modification.

 (Reset) Reset to enter the reset (running) state in case of fault tripping or alarm.

◇ DB9 test interface

The test interface on the intelligent controller panel has three functions.

DC24V 电源输入口

It can be directly input into DC24V power supply, which can be used as an auxiliary power supply of intelligent controller. Among them, the 4 and 5 terminals of the Db9 interface are connected to the anode 2 and 9 terminals of DC power supply and connected to its cathode (i.e. power ground).

Analog signal input port

It can directly input the analog signal of three-phase current and test the current protection characteristics of the intelligent controller. Among them, terminal 7 of Db9 interface is connected to analog signal of phase A current, terminal 6 is connected to analog signal of phase B current, 1 terminal is connected to analog signal of phase C current, and terminals 2 and 9 are connected to the common ground of analog signal.

◇ Programming and communication interface

Type 3H intelligent controller or 3M intelligent controller added with the function of "using ZQW18 programmer" can use ZQW18 programmer on the Db9 interface, and can also communicate with the upper computer through this interface. Among them, terminal 3 of Db9 interface is connected to RS485-A terminal (equivalent to line 10#) and terminal 8 is connected to RS485-B terminal (equivalent to line 11#).

◇ Red mechanical reset button

This button will pop up in case of fault trip or test trip, and the circuit breaker can be closed only after pressing the button is pressed.

◇ Backlight of LCD screen

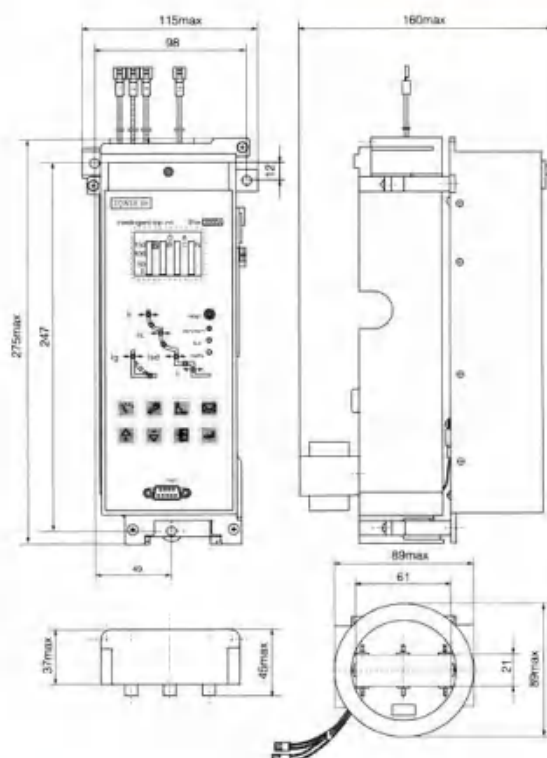
The intelligent controller is designed to have no backlight when it is powered on, so as to improve the working stability of the intelligent controller under low current without auxiliary power supply.

Press any key to turn on the backlight, press both  and  keys at any interface to turn off the backlight. The backlight will turn off automatically 5 minutes after no key is pressed.

◇ Full display status of LED indicator

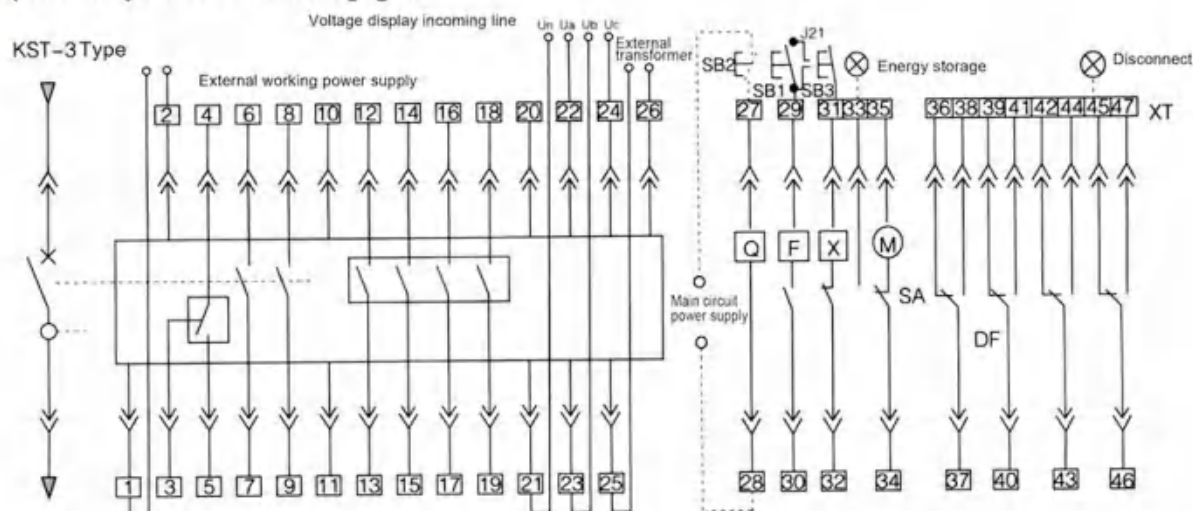
When the  and  keys are pressed at the same time under the reset (operation) interface, the system will enter the LED indicator full display state. In this state, the LED indicators are all on, and the LCD screen will display product information. When pressing the  key under the LED indicator light status, the system will return to the reset (running) interface immediately. The system will return to the reset (running) interface automatically after 5 minutes without pressing any key.

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Wiring between intelligent controller and circuit breaker

◆ When the intelligent controller is connected with the circuit breaker, the number of each lead and the number of the socket must correspond one by one. See the following figure.



Function description of lead wire

1#, 2# line auxiliary power input

Output terminal of the first group of auxiliary contacts in circuit breaker status of line 6# and 7#.

Outgoing line A and B of RS485 communication interface of line 10# and 11#.

Output terminal of the second group of signal contacts of intelligent controller of line 14# and 15#.

Output terminal of the fourth group of signal contact of 18 19 # intelligent controller

21#, 22#, 23#, 24# line voltage display input terminal

3#, 4#, 5# line output terminal of fault trip contact (of which 4# line is the common terminal)

Output terminal of the second group of auxiliary contacts in circuit breaker status of line 8# and 9#.

Output terminal of group1 signal contact of intelligent controller of line 2 # and 13#.

Output terminal of the third group of signal contact of intelligent controller of line 16# and 17#.

20# line protective grounding wire

25# and 26# lines are externally connected to the input end of transformer.

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Common fault causes and solutions

Question	Cause	Solution
Self-diagnosis fault alarm	Overload tripping (Ir1 indicator lights up)	1. Check the action time of breaking current value on the intelligent controller. 2. Analyze the load and power grid. 3. If the overload occurs, please eliminate the overload fault. 4. If the actual running current does not match the setting value of the long-delay action current, please modify the setting value of the long-delay action current according to the actual running current to properly match the protection. 5. Press the Reset button to reclose the circuit breaker.
	Short circuit tripping (Ir2 or Ir3 indicator lights up)	1. Check the breaking current value and action time on the intelligent controller. 2. If it is short-circuited, please find and eliminate the short-circuit fault. 3. Check the setting value of the intelligent controller. 4. Check the integrity of the circuit breaker. 5. Press the Reset button to reclose the circuit breaker.
	Grounding trip (Ird indicator lights up))	1. Check the breaking current value and action time on the intelligent controller. 2. If there is a grounding fault, please find and eliminate it. 3. Modify the setting value of grounding fault current of intelligent controller. 4. If there is no grounding fault, please check whether the setting value of fault current matches the actual protection. 5. Press the Reset button to reclose the circuit breaker.
	Mechanical interlocking action	Check the working status of two circuit breakers equipped with mechanical interlocking.
	Under-voltage tripper fault: the rated working voltage is less than 70%, UE under-voltage tripper control unit fault	1. whether the power supply of the undervoltage release is connected. 2. Check that the power supply voltage of the undervoltage release must be $\geq 85\% U_e$. 3. Replace the control unit of undervoltage release.
Circuit breaker can not close	The Reset on the intelligent controller is not reset (protruding panel)	Press the Reset button to reclose the circuit breaker
	The secondary circuit contactor of the drawer type circuit breaker is poor	Swing the drawer-type circuit breaker to the "on" position (hear click twice).
	The circuit breaker fails to store energy	Check whether the secondary circuit is connected. 1. Check that the power supply voltage of the motor controller must be $\geq 85\% U_s$. 2. Check the motor energy storage mechanism. If there is any fault, please contact the manufacturer to replace the motor operating mechanism.
	The mechanical interlocking action circuit breaker has been locked	Check the working status of two circuit breakers equipped with mechanical interlocking.
	The rated control voltage of the closing electromagnet is less than 85%. The closing electromagnet is damaged due to fault	1. Check that the power supply voltage of the closed electromagnet must be $\geq 85\% U_s$. 2. Replace the closed electromagnet
	Undervoltage release voltage is less than 85%. Ue release without voltage release is damaged and does not work	The voltage must be $\geq 5\% U_e$ connect the power supply and replace the release.
	Improper wiring of shunt release causes release action	Check the circuit and correct it (the opening button is wrongly connected in normally closed position)

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Question	Cause	Solution
The circuit breaker is closed and tripped in hour (the fault indicator is on)	Immediate tripping closes the short-circuit current Delayed tripping closes the overload current	1. Check the breaking current value and action time on the intelligent controller. 2. If it is short-circuited, please find and eliminate the short-circuit fault. 3. If it is overloaded, please find and eliminate the overload fault. 4. Check the integrity of the circuit breaker. 5. Modify the current setting value of the intelligent controller. 6. Press the Reset button to reclose the circuit breaker.
The circuit breaker can not be disconnected	The circuit breaker can not be manually disconnected locally Mechanical operating mechanism failure The circuit breaker cannot be electrically disconnected at a long distance Mechanical operating mechanism failure The power supply voltage of shunt release is less than 70% U_s The shunt release is damaged	1. Check the mechanical operating mechanism. Please contact the manufacturer in case of jamming and other fault. 2. Check whether the power supply voltage of shunt release is less than 70% U_s. 3. Replace shunt release
The circuit breaker can not store energy	No manual energy storage, no electric energy storage The control power supply voltage of the rated control electric energy storage device is less than 85% U_s, and the mechanical failure of the energy storage device	Mechanical failure of energy storage device, contact the manufacturer. 1. check that the control power supply voltage of electric energy storage device is $\geq 85\% U_s$. 2. Check energy storage device and contact the manufacturer.
The handle of drawer type circuit breaker can not be inserted into and out of the circuit breaker	There is a padlock plug guide rail at the disconnection position or the breaker body is not fully pushed in	Remove the padlock and push the guide rail or breaker body to the bottom.
The drawer-type circuit breaker can not be pulled out at the "off" position	The handle is not pulled out of circuit breaker. The "off" position is not completely reached	Pull out the rocker handle and fully swing the circuit breaker to the "off" position.
The drawer-type circuit breaker can not be swung to the "on" position	There are foreign matter falling into the drawer base and blocking the swing in mechanism or gear tripping of the swing in mechanism and other fault circuit breakers. The body of the circuit breaker does not match the rated current of the shell frame of the drawer base.	Check and remove foreign matter. If they can't be shaken in, contact the manufacturer to select the circuit breaker body and drawer base with the same frame level and rated current.
No display on intelligent controller screen	The intelligent controller is not connected to the power supply.	The user should check whether the intelligent release is connected to the power supply. If not, please connect the power supply immediately, cut off the control power supply of the intelligent controller and then power on again. If the fault still exists, please contact the manufacturer.
The fault indicator of the intelligent controller is on It is still on after pressing the clear button	The intelligent controller is faulty.	Cut off the control power supply of the intelligent controller, and then send the power supply. If the fault still exists, please contact the manufacturer.



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Order specification

User unit		Order sum		Date of order	
Model ☐ ZQW18-2000 (I Frame) ☐ ZQW18-3200 (II Frame) ☐ ZQW18-4000 (II Frame) ☐ ZQW18-6300 (II Frame)		☐ Fixed ☐ Drawer $I_n \geq 4000A$ without fixed type		☐ 3-pole ☐ 4-pole Three-pole rated current $I_n=A$ Four-pole rated voltage ☐ AC380(400)V ☐ AC660(690)V	
Intelligent controller	Fundamental function				Additional functions or accessories can be added
Intelligent controller	M type	☐ M	Long-delay, short-delay, instantaneous and single-phase grounding fault protection	1. Various status indication and numerical display 2. Ammeter 3. Fault memory 4. Thermal memory 5 experiment	☐ 1. Load monitoring ☐ 2. Voltmeter ☐ 3. M Acknowledge the on/off and simulated release ☐ 4. Signal unit for pre-alarm and self-diagnosis OCR tripping alarm
	H type	☐ H	1. Long delay, short delay, instantaneous and responsible for monitoring. 2. Single-phase grounding fault protection, 3. Various status indicators and numerical displays, 4. Ammeter 5. Voltmeter 6. Fault memory 7. Thermal memory 8. Experiment 9.RS485 single-line interface 10. Alarm fault status		☐ MCR on/off and analog tripping ☐ RS485/232 converter ☐ Power transformer ☐ -220V ☐ -380V ☐ -220V ☐ -110V ☐ DP module
	Controller power supply		☐ AC220V ☐ AC380V		
Attachment	☐ Undervoltage release	☐ AC220V ☐ AC380V ☐ Undervoltage comfortable release ☐ Undervoltage delay release ☐ 1s ☐ 2s ☐ 3s			
	☐ Shunt release	☐ AC220V ☐ AC380V ☐ DC220V ☐ DC110V			
	☐ Energy release (closing) electromagnet	☐ AC220V ☐ AC380V ☐ DC220V ☐ DC110V			
	☐ Motor operating mechanism	☐ AC220V ☐ AC380V ☐ DC220V ☐ DC110V			
	☐ Mechanical interlock	☐ Horizontal interlocking ☐ Vertical interlocking ☐ Door interlocking			
	☐ Position key lock				
	☐ Door frame				
	☐ External single-phase grounding transformer	☐ Difference type (vector sum) ☐ Ground current type			
Connect	☐ Horizontal connection ☐ Vertical connection				
Remarks					

Note

If the user selects the controller, additional functions or accessories can be added, which requires additional costs.

The setting value of the long delay of L-type controller is 10% of I_n , decreasing in each gear.

The conventional factory setting (M, H type) the long delay current $1.0I_n$ and the action time of $1.5I_n$ is 15s, the short delay current $8I_r$, delay 0.4s the instantaneous $12I_n$, ground fault current $0.8I_n$ and the action time OFF. The 6300A has no four poles.

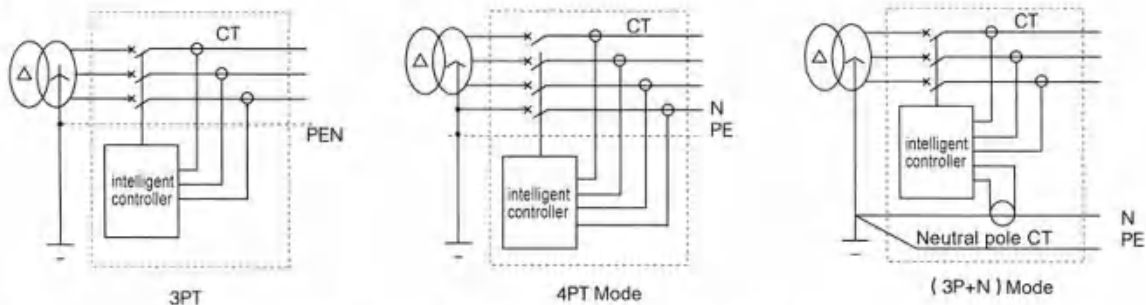
ZQW18 Intelligent universal circuit breaker

Appendix

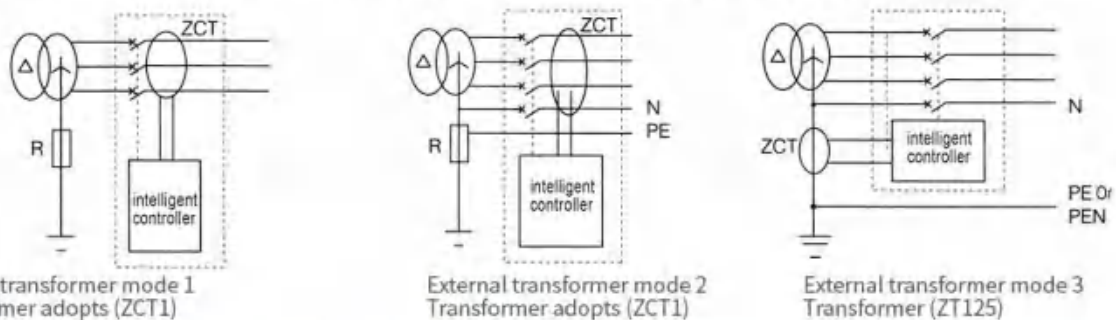
Grounding and leakage protection

Single-phase grounding protection refers to the metallic grounding protection with fault current over several hundred amperes, which is generally used in the neutral point direct grounding system. The controller has two different protection modes. One is the vector sum mode (grounding protection) of internal transformer, which performs protection according to the vector sum of three-phase current and neutral current. According to the number of breaker poles, it is divided into three forms: 3PT 4PT (3P+N)T (see the figure below).

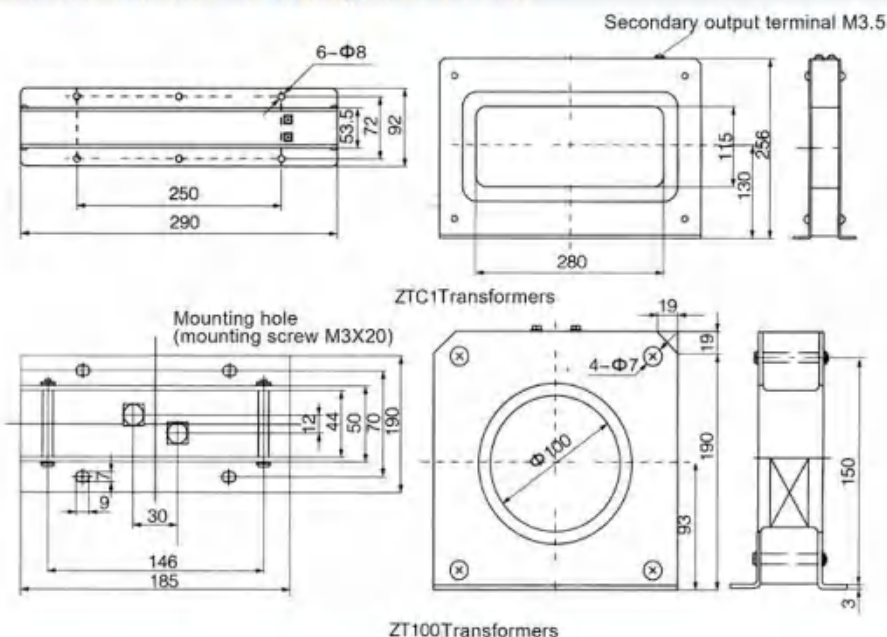
This method is generally suitable for balancing load, unbalanced load or motor load. Generally, it only gives an alarm without tripping.



The other is the external leakage transformer mode (leakage protection). The controller directly takes the output current signal of an external current transformer for protection. Generally, the secondary output of the transformer is 5A/1A (when the primary current of the transformer is less than or equal to 400A, the secondary is 5A when the secondary current is more than 1A 400A). This scheme has high sensitivity and is especially suitable for the protection of small grounding current starting from several amperes.



Structural dimensions of external leakage transformer



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universal
circuit
breaker

Molded case
circuit breaker

Intelligent
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Leakage
molded case
circuit breaker

Miniature
circuit breaker

Self-resetting
overvoltage
and
undervoltage

dual power
switch

Load
disconnecter

Contactor
thermal relay

Branch/busbar

ZQW18-1600

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breaker





ZQW18-1600 Intelligent universal circuit breaker

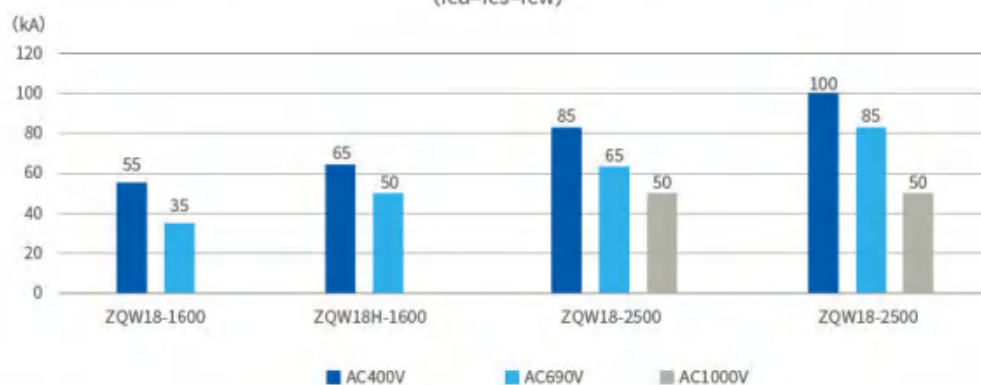


Rated current

Rated current(A)	200	400	630	800	1000	1250	1600	2000	2500	3200	4000
Degree of Case											
ZQW18-1600											
ZQW18-2500											
ZQW18-4000											

Short-circuit breaking capacity & Short-time withstand current

short-circuit breaking capacity & short-time withstand current for case
($I_{cu}=I_{cs}=I_{cw}$)



Notes: $I_{cu}=I_{cs}=I_{cw}$ for ZQW18-2500 & 4000. As described for ZQW18 technical specification table

Mounting mode

Upper & Bottom incoming for main circuit are acceptable.

ZQW18-1600 with horizontal connection mode, ZQW18,2500、4000 with multiple connection modes

Connection mode		ZQW18-1600	ZQW18-2500	ZQW18-4000
Routine	Horizontal	√	√	√
	Vertical	-	√	√
Special	Different	-	√	√
	Upper horizontal & Bottom vertical Upper vertical & Bottom horizontal	-	√	√



ZQW18-1600 Intelligent universal circuit breaker

Multiple Protection Device

Draw out-type air circuit breaker shall include door interlock, draw out-type three positions lock and unlock device, disconnection position key-lock, closing / opening button lock protection device.

Application Scope

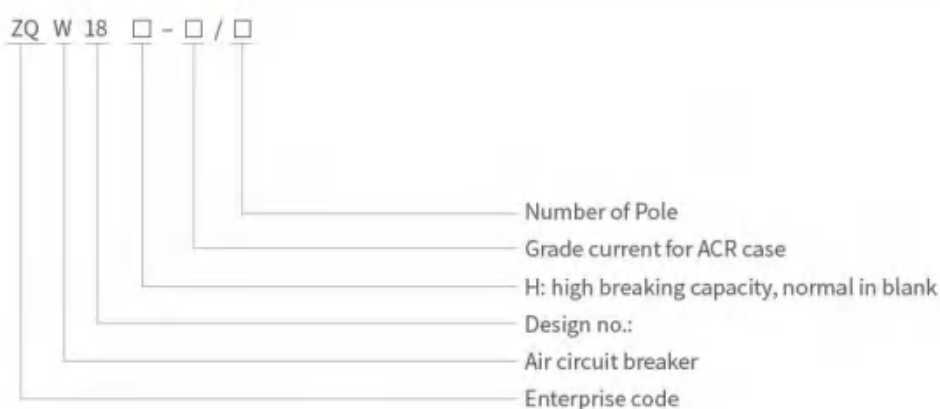
ZQW18 series air circuit breaker, which is suitable for AC50Hz, Rated current 200A~4000A, Rated insulation voltage 1140V, Rated operation voltage AC400V/AC690V/AC1140V in distribution system and which distribute the power and protect circuit, power supply device against fault to overload, under-voltage, short-circuit and single-phase damage and also disconnect function. Air circuit breaker with multiple functions and high selection protection, which improve the reliability of power supply.

Characteristics

- ◇ Width pole pitch, easy to connect & install, more safety
- ◇ High breaking capacity, zero arcing distance and high safety,
- ◇ Module construction, flexible application and small size
- ◇ Be equipped with three positions lock and unlock device, safety and reliability operation,
- ◇ Completing and reliability smart protection function
- ◇ Horizontal, vertical and hybrid connection modes,
- ◇ Upper or bottom connection is acceptable,
- ◇ Integrated communication mode is suitable for multiple protocol.

Type symbol

ZQ W 18 □ - □ / □



Standard & Certificate

- ◇ Compliance with Part No.:1 General of IEC60947 Low Switch and Control Equipment
- ◇ Compliance with Part No.: 2 Low Voltage Switch Circuit Breaker of IEC60947 Low Switch and Control Equipment



ZQW18-1600 Intelligent universal circuit breaker

Normal service conditions:

- ◇ Ambient temperature: $-5^{\circ}\text{C} \sim +40^{\circ}\text{C}$; the average value no more than $+35^{\circ}\text{C}$ within 24 hours
- ◇ Ultimate air conditions: Maximum temperature: $+40^{\circ}\text{C}$, Air relative humidity no more than 50%. Higher relative humidity
- ◇ While lower temperature, for example: 20°C up to 90%. To make provision for occasional incur due to dewing.
- ◇ Site altitude: $\leq 2000\text{m}$.
- ◇ Level of contamination: III
- ◇ Mounting conditions: Perpendicularity & angularity of air circuit breaker $\leq 5^{\circ}$. Air circuit breaker is installed under non-explosive, nonconducted dust, non-sufficient corrosion metal and without destructive insulation conditions.
- ◇ Mounting category: Mounting category IV for main circuit of air circuit breaker, under-voltage trip coil and the power transformer primary coil. Mounting category III for other supplement circuit and control circuit.
- ◇ Degree of protection: IP30, IP40 (Mounting protective frame)
- ◇ Utilization category: B

Construction diagram





ZQW18-1600
Intelligent universal circuit breaker

Construction diagram





ZQW18-1600

Intelligent universal circuit breaker

◇ Draw out-type air circuit breaker three positions lock

Draw out-type base must have connection, testing and closing position by a indicator. Air circuit breaker shall be locked respectively on the three positions by the handle and, shall push three-position unlock button for release.

◇ Draw out-type air circuit breaker position lock device

the base must have connection/testing/closing position padlock. the base cannot be moved other positions after pulling out the padlock. The padlock is provided for the user.

Use of air circuit breaker

◆ Draw out-type air circuit breaker body inserting operation

- Both sides of rails on the base by the handle for manual operation.
- Air circuit breaker body is put on the rails, please note that protruding support of both sides of air circuit breaker shall be inserted into rails groove.
- Hands hold and lift slight upward handles of both sides of air circuit breaker and vigorously push air circuit breaker body until stop. Air circuit breaker indicator shall be verified in the OFF position before push air circuit breaker body.
- Insert into the handle, push three positions unlock button and turn handle until give off "TA" sound, then popup three positions unlock button. Now three positions indicator show "TEST" position, second push three position unlock button and turn handle until give off "TA" sound. However, not turn the handle and air circuit breaker body reach connection position.
- Pull out the handle and reset

Notes:

- Air circuit breaker shall be disconnected, air circuit breaker body shall be moved from testing position to connection against accident.
- the base shall be verified in OFF position before push air circuit breaker body into drawer base against accident.

◆ Draw out-type air circuit breaker withdrawing operation

Air circuit breaker shall be moved from connection to close position after inserting the handle and push three positions unlock button, then turn the handle counterclockwise. Three positions unlock mode is compliance with air circuit breaker body inserting operation.

Notes:

Air circuit breaker body shall be close against accident before pull air circuit breaker from connection to testing position.

◆ Air circuit breaker energy storage operation

◇ Energy storage manual

Pull energy storage handle 6-7 times until hear "click" , the hands cannot feel counter-force and show energy storage simultaneously. Energy storage, which is over.

◇ Power energy storage

Store the energy automatically after controlling circuits on power. Stop automatically after energy storage.

◆ Air circuit breaker close/open operation

◇ Close/open manual

Close: Air circuit breaker is in the state of energy storage and trip, push green I button and air circuit breaker close, close/open show the status from "O" to "I" .

Open: Air circuit breaker is in the state of closing, push red O button, air circuit breaker trip, close/open show the status from "I" to "O" .

◇ Close/open power

Close: Air circuit breaker is in a state of energy storage and trip for imposing rated control voltage on close electromagnet. Close electromagnet action and air circuit breaker close.

Open: Air circuit breaker is in a state of close and impose rated control voltage on shunt release. Shunt release action and air circuit breaker.



ZQW18-1600

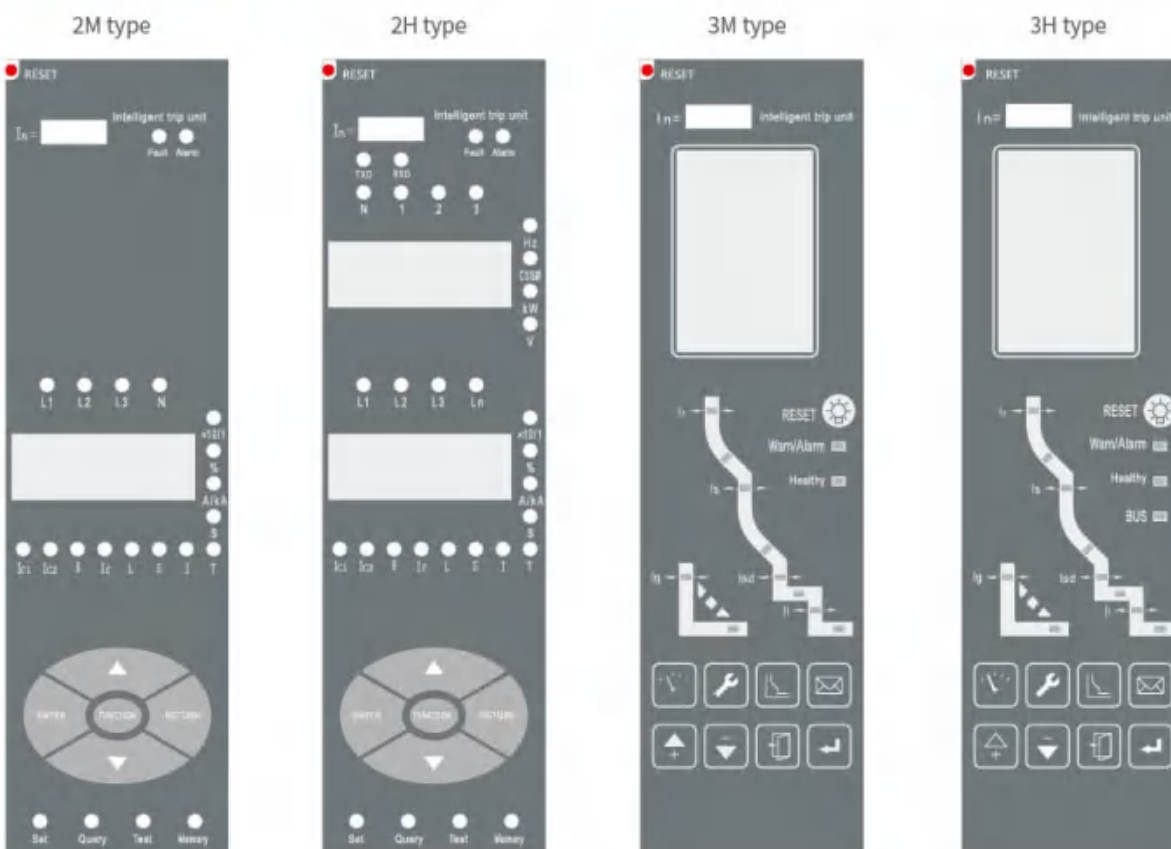
Intelligent universal circuit breaker

Product Characteristics

Type			ZQW18-1600	ZQW18H-1600	ZQW18-2500	ZQW18-4000
Breaking capacity			S-normal	H-high breaking	/	/
Rated current (A)	In		200,400,630,800, 1000,1250,1600		630,800,1000, 1250,1600, 2000,2500	2000,2500,2900, 3150,3200,3600, 3900,4000
Rated service voltage (V)	Ue		AC 400V/690V		AC 400V / 500V / 690V / 800V / 1140V	
Rated insulation voltage (V)	Ui		1000V		1140V	
Rated impulse withstand voltage (kV)	Uimp		12			
Number of poles	P		3,4			
Rated current for N pole (A)			100%In			
Rated ultimate short-circuit breaking capacity (kA)	Icu	400V	55	65	85	100
		690V	35	50	65	85
		1000V	/	/	50	50
Rated operation short-circuit breaking capacity (kA)	Ics	400V	42	55	85	100
		690V	35	42	65	85
		1000V	/	/	50	50
Rated short-circuit withstand current (kA/1s)	Icw	400V	42	50	85	100
		690V	35	42	65	85
		1000V	/	/	50	50
Rated short-circuit making capacity (kA)	Icm	400V	110	143	187	220
		690V	73.5	105	145.2	187
		1000V	/	/	110	110
Breaking time (ms)			< 30			
Closing time (ms)			< 70			
Life (C/O period)	Mechanism		25000		20000	15000
	Electric		10000		8000	8000
Overall dimension : H×W×D (mm) D no including busbar	Draw out-type	3P	354×254×305		435×375×410	435×435×410
		4P	354×324×305		435×470×410	435×550×410
	Fixed-type	3P	324×269×203		398×368×299	398×430×299
		4P	324×339×203		398×463×299	398×545×299

ZQW18-1600 Intelligent universal circuit breaker

Controller category



Controller functions

Function items	2M	2H	3M	3H
Display interface				
Digital tube display	•	•	-	-
LCD display	-	-	•	•
Protection functions				
Overload long delay protection	•	•	•	•
Overload thermal memory	•	•	•	•
Overload pre-alarm/alarm signaling operation	●/○	●/○	●/○	●/○
Short-circuit short delay protection	•	•	•	•
Short delay thermal memory	•	•	•	•
Short-circuit instantaneous protection	•	•	•	•
Grounding protection (Differential T)	•	•	•	•
Grounding alarm/ alarm signaling operation	●/○	●/○	●/○	●/○
Leakage protection /alarm/ alarm signaling operation (and grounding protection for selection)	○/○/○	○/○/○	○/○/○	○/○/○
Neutral solidly grounded protection	•	•	•	•
Current asymmetric protection/alarm/ alarm signaling operation	●/●/○	●/●/○	●/●/○	●/●/○
MCR/HSISC	○/○	○/○	○/○	○/○
Load monitor/ alarm/ alarm signaling operation	○/○/○	●/●/○	○/○/○	●/●/○



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Intelligent universal circuit breaker

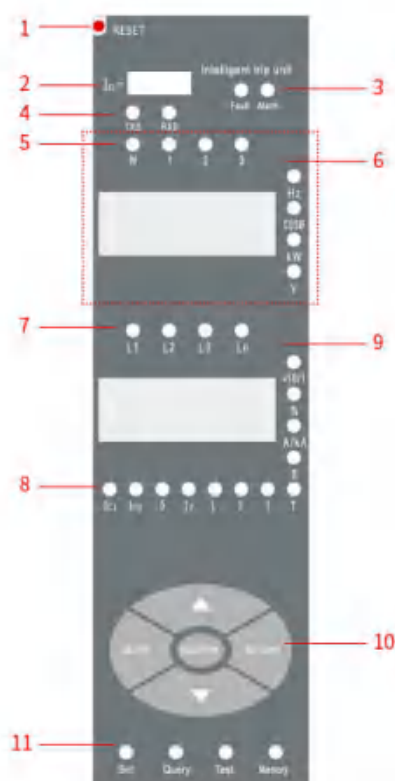
Function items	2M	2H	3M	3H
Display interface				
Under-voltage protection/alarm/alarm signaling operation	-	-	●/●/○	●/●/○
Over-voltage protection/ alarm/ alarm signaling operation	-	-	●/●/○	●/●/○
Voltage asymmetric protection / alarm/ alarm signaling operation	-	-	●/●/○	●/●/○
Phase sequence protection/ alarm/ alarm signaling operation	-	-	●/●/○	●/●/○
Under-frequency protection / alarm/ alarm signaling operation	-	-	●/●/○	●/●/○
Over-frequency protection / alarm/ alarm signaling operation	-	-	●/●/○	●/●/○
Current allowable-value protection/ alarm/ alarm signaling operation	-	-	●/●/○	●/●/○
Reverse-power protection / alarm/ alarm signaling operation	-	-	●/●/○	●/●/○
Testing functions				
Current testing (Phase-poles, N-pole and Grounding)	●	●	●	●
Voltage testing (Phase-voltage, Cable-voltage and Voltage asymmetric rate)	○	● (no-voltage asymmetric rate)	●	●
Phase sequence testing	-	-	●	●
Frequency testing	○	●	●	●
Allowable-value testing (Current)	-	-	●	●
Allowable-value testing (Power)	-	-	●	●
Power testing (Active & Reactive power)	○	● (active power)	●	●
Power factor testing	-	● (total power factor)	●	●
Power energy testing (Active & Reactive power energy)	-	-	●	●
Harmonics testing	-	-	○	○
Maintenance functions				
Fault status indicating	●	●	●	●
Fault record and query	●	●	●	●
Past record of peak current	-	-	●	●
Past record of alarm and query	-	-	●	●
Fault to trip signaling operation	●	●	●	●
Self-diagnostics function	●	●	●	●
Analog tripping test function	●	●	●	●
Contacts abrasion equivalent (alarm) query	●	●	●	●
Operation times query	●	●	●	●
Clock functions	○	○	●	●
Other				
Signal unit	○	●	○	●
Communication	-	●	-	●
Regional selective interlock	○	○	○	○

Remarks: "●" with this function, "○" function for selection, "-" without this function



ZQW18-1600 Intelligent universal circuit breaker

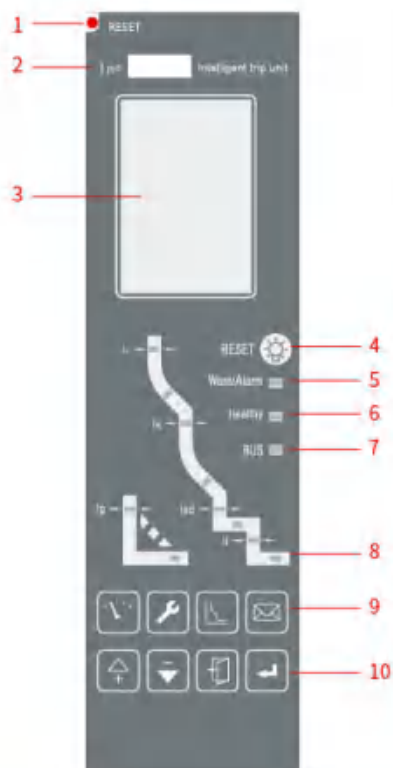
Controller Panel



◇2M/2H type controller

1. Fault to trip & reset
2. Rated current for name-plate
3. In sequence of fault & alarm indicating
4. In sequence of communication emission & receiver indicating
5. In sequence of N phase, A phase, B phase, C phase voltage indicating
6. In sequence of frequency, power factor, power, voltage indicating from upper to bottom
7. In sequence of A phase, B phase, C phase, N phase current indicating
8. In sequence of load monitor1, load monitor 2, asymmetric current, grounding protection, over-load long delay, short-circuit short delay, short-circuit instantaneous indicating
9. In sequence of opening & closing time, main contacts abrasion rate, current unit, time, self-diagnostics fault statuses indicating from upper to bottom
10. 5 pieces operation buttons
11. In sequence of controller setting, query, testing, store service status indicating
12. Notes:

1. The dashed box is controller with voltage indicating function. Without indicating if no.
2. Serial no.: 4 is with communication function controller. Without indicating if no.
3. A/kA of serial no.: 9, light fixed is current A and continuous blinking in kA
4. kW of serial no.: 6, light fixed is active power and continuous blinking is reactive power



◇3M/3H type controller

1. Fault to trip & reset
2. Rated current for name-plate
3. LCD indicating interface
4. Fault/alarm resetting button
5. Fault/alarm LED indicating (LED without light while normal working. LED with continuous blinking quickly while fault to trip. LED with light fixed while alarm)
6. LED always continuous blinking while controller on power and normal working status
7. Communication indicating (Modbus: extinguish without communication. Continuous blinking while communication. Proibus: extinguish without communication. Light fixed while communication)
8. Curve LED (Fault to trip at corresponding LED light flash indicating fault type. LED light fixed indicating present setting items while protective parameter setting)
9. In sequence of testing function, setting function, protection function and information function button. From left to right
10. In sequence of upward, downward, ESC and selection OK button. from left to right

Remarks: Serial no.: 7 is with communication function controller. No indicating if no-communication function

ZQW18-1600

Intelligent universal circuit breaker

Controller Setting and Protective Characteristics

Over-load long delay protection 2M/2H type & 3M/3H type		
Current setting I_R	(0.4~1.0 or 1.25) I_n or OFF (OFF-function close) Notes: Distribution protection is $1.0 I_n$; Generator protection is $1.25 I_n$.	
6 categories protective curve	S_I : Normal inverse time $t=0.01396 TR / (N0.02-1)$ V_I : Fast inverse time $t= TR / (N-1)$ $E_I (G)$: Express inverse time (use of general distribution protection) $t=3 TR / (N2-1)$ $E_I (M)$: Express inverse time (use of generator protection) $t=2.95 TR \times I_n [N2 / (N2-1.15)]$ H_V : High voltage fuse compatibility $t=15 TR / (N4-1)$ $I2t$: Normal distribution protection $t=2.25 TR / N2$ (factory default) $N=I/I_R$ I-fault current t-long delay acting time I_R -long delay setting current TR -long delay setting time Remarks: only normal distribution protection $I2t$ for 2M/2H type controller. other protective curves shall be order. 3M/3H type controller with 6 categories protective curve for selection.	
6) Normal distribution protection $I2t$ time setting TR (1.5 I_R)	2M/2H: 15,20,25,30,40,50,60,80,100,120,160,200,240,320,400,480 (s) 3M/3H: 15,30,60,120,240,360,480,600,720,840,960 (s)	
1) ~5) Protective curve type	3M/3H: C1-C16 over-load long delay protective operating delay time in the drop-down list	
Protective characteristics (Accuracy $\pm 10\%$)	Current (I/I_R)	Trip time
	1.05	> 2h no-acting
	1.3 (Distribution protection)	< 2h acting
	1.2 (Motor protection)	< 2h acting
Thermal memory time	$\geq 1.2 I_R$	Acting time as per 6 categories protection type formula calculator or curve query
	2M/2H type: 30ms (ON) or power failure release 3M/3H type: instantaneous,10ms,20ms,30ms,45ms,1hr,2hrs,3hrs or power failure release Remarks: connecting controller for auxiliary power supply with thermal memory function and auxiliary power supply failure, that is, release thermal memory.	
	Short-circuit short delay protection 2M/2H type & 3M/3H type	
	Current setting I_{sd} (1.5~15) I_R or OFF (OFF-functions close)	
Time setting T_{sd} (s)	T_{sd1} inverse time	2M/2H type: 0.1~1
	T_{sd2} definite time	3M/3H type: 0.1,0.2,0.3,0.4 (selection: 0.1~1)
	Current (I/I_{sd})	Trip time
	≤ 0.9	No-acting
	≥ 1.1	inverse time $I_{sd} \leq I \leq 8 I_R$
		definite time $I > 8 I_R$ (or $I \geq I_{sd}$)
Thermal memory time	curre 1-5 and over-load long delay simultaneously, but curve speed faster 10 times. curre 6 characteristics formula $t=64 T_{sd}/N2$ delay protection as per definite time delay setting time T_{sd}	
	2M/2H type: 15min (ON) or power failure release 3M/3H type: instantaneous,10ms,20ms,30ms,45ms,1hr,2hrs,3hrs or power failure release Remarks: connecting controller for auxiliary power supply with thermal memory function and auxiliary power supply failure, that is, release thermal memory.	
	Short-circuit instantaneous protection 2M/2H type & 3M/3H type	
	Current setting I_i 2M/2H type: $1.0 I_n$ ~50kA or OFF (OFF-function close) 3M/3H type: (1.0~20) I_n or OFF (OFF-function close)	
Protective characteristics (Accuracy $\pm 10\%$)	Current (I/I_i)	Trip time
	≤ 0.85	no-acting
	> 1.15	< 40ms acting



ZQW18-1600

Intelligent universal circuit breaker

Controller setting and Protective Characteristics

MCR/HSISC protection 2M/2H type & 3M/3H type				
Current setting I_{MCR}		ZQW18-1600: 35kA ZQW18-2500: 50kA ZQW18-4000:50kA Remarks: this is factory default which the user cannot adjust (for selection 30~100kA)		
Current setting I_{HSISC}		ZQW18-1600: 50kA ZQW18-2500: 65kA ZQW18-4000: 80kA Remarks: this is factory default which the user cannot adjust (for selection 30~100kA)		
Protective characteristics (Accuracy $\pm 10\%$)		Current ($I/I_{MCR}/$ HSISC)	Trip time	
		< 0.8	no-acting	
		> 1.0	< 30ms acting	
Grounding protection/alarm 2M/2H type & 3M/3H type				
Protection type		Differential type (T)、Earth current type (W) , alternative .factory default is differential type (T)		
Current setting I_g		(0.2~1.0) In or OFF (OFF-function close)		
Time setting T_g	Definite time delay T_g (s)	0.1~1or OFF (OFF-only alarm and no trip)		
	Inverse time factor KG	1.5~6 or OFF (OFF-grounding protection is definite time)		
Protective characteristics (Accuracy $\pm 10\%$)		Current (I/I_g)	Trip time	
		≤ 0.8	No-acting (no alarm)	
		≥ 1.0	$(I/I_g) < KG$	Inverse time delay acting (or alarm) $t=T_g \times KG \times I_g/I$
			$(I/I_g) \geq KG$	Definite time delay acting (or alarm) as per time setting
Grounding alarm 3M/3H type				
Performance mode		Alarm /Close		
Alarm operating current setting		(0.2~1.0) In		
Alarm operating delay time setting		0.1~1.0 (s)		
Alarm return current setting		(0.2~1.0) In		
Alarm return delay time setting		0.1~1.0 (s)		
Alarm operating characteristics (Accuracy $\pm 10\%$)		Multiple of current (I/I setting)		Acting time
		< 0.8		No-alarm
		≥ 1.0		Alarm (time as per alarm operating time setting)
Alarm return characteristics (Accuracy $\pm 10\%$)		≥ 1.0		Alarm without return
		≤ 0.9		Alarm return (time as per alarm return time setting)
Neutral protection 2M/2H type & 3M/3H type				
Neutral protective setting		2M/2H type: 50%In,100%In or OFF; 3M/3H type: 50%In,100%In,160%In,200%In or OFF。 OFF- close N phase protective function		
Protective characteristics		Same as phases and poles over-load long delay protection, short-circuit short delay protection, short-circuit instantaneous protection and grounding protection		
Leakage protection/alarm 2M/2H type & 3M/3H type				
Current setting $I \Delta n$ (A)		0.5~30 or OFF (OFF-function close)		
Operating delay time $T \Delta n$ (s)		Instantaneous,0.06,0.08,0.17,0.25,0.33,0.42,0.5,0.58,0.67,0.75,0.83		
Protective characteristics (Accuracy $\pm 10\%$)		Multiple of current ($I/I \Delta n$)		Trip time
		< 0.8		No-acting
		≥ 1.0		Acting (time in the drop-down list)

ZQW18-1600

Intelligent universal circuit breaker

Controller Setting and Protective Characteristics

	Setting time	Instantaneous	0.06	0.08	0.17	0.25	0.33	0.42	0.5	0.58	0.67	0.75	0.83
Trip time t (s) Accuracy (±10%)	1 Δ n	0.04	0.36	0.5	1	1.5	2	2.5	3	3.5	4	4.5	5
	2I Δ n	0.04	0.18	0.25	0.5	0.75	1	1.25	1.5	1.75	2	2.25	2.5
	5I Δ n	0.04	0.07	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1
	10I Δ n		2										
Alarm performance mode (3M/3H type controller)			Alarm/ Close										
Alarm acting current setting			0.5~30 (A)										
Alarm acting delay time setting			0.1~1.0 (s)										
Alarm return current setting			0.5~30 (A)										
Alarm return delay time setting			0.1~1.0 (s)										
Alarm operating characteristics (Accuracy±10%)			Multiple of current (I/I Δ n)				Acting time						
			< 0.8				No alarm						
			≥ 1.0				Alarm (time as per alarm acting time setting)						
Alarm return characteristics (Accuracy ±10%)			≥ 1.0				Alarm without return						
			≤ 0.9				Alarm return (time as per alarm return time setting)						
Current asymmetric protection/Alarm 2M/2H type & 3M/3H type													
2M/2H type			Current asymmetric rate setting δ					(40%~100%) or OFF (OFF-function close)					
			Acting delay time setting Tδ					0.1~1.0 (s) or OFF (OFF-alarm no trip)					
3M/3H type			Performance mode					Alarm /Trip /Close					
			Protective start setting					5%~60%					
			Acting delay time setting Tδ					0.1~40 (s)					
			Alarm acting return setting					5%~Start setting					Performance mode is alarm for setting this item
			Alarm return delay time					10~200 (s)					
Protective characteristics (Accuracy ±10%)			Actual current asymmetric rate/setting					Trip time					
			< 0.9					No-acting (No-alarm)					
			≥ 1.1					Acting (or alarm) as per setting delay time					
Alarm return characteristics (Accuracy±10%)			Actual current asymmetric rate/setting					Acting time					
			≥ 1.1					No return					
			≤ 0.9					Return as per alarm return delay time					
Allowable current value protection/Alarm 3M/3H type													
Performance mode			Close / Trip / Alarm (required current value protection for each phase setting)										
Protection/Alarm start setting			(0.2~1.0) In										
Protection acting delay time setting			15~1500 (s)										
Alarm acting return setting			0.2In~ Start value					Performance mode is alarm for setting this item					
Alarm return delay time			15~3000 (s)										
Protective characteristics (Accuracy ±10%)			Multiple of current (I/I operating setting)					Trip time					
			< 0.9					No-acting (No-alarm)					
			≥ 1.1					Acting (or alarm) as per setting delay time					
Alarm return characteristics (Accuracy±10%)			Multiple of current (I/I operating setting)					Acting time					
			≥ 1.1					No return					
			≤ 0.9					Return as per alarm return delay setting time					



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Controller Setting and Protective Characteristics

Under-voltage protection/Alarm 3M/3H type		
Performance mode	Close / Trip / Alarm	
Protection/Alarm start setting	100 (v) ~Return value	
Protection acting delay time setting	0.2~60 (s)	
Alarm acting return setting	Start value~1200 (v)	Performance mode is alarm for setting this item., Return value $\geq$ start value
Alarm return delay time	0.2~60 (s)	
Protective characteristics (Accuracy $\pm 10\%$)	Multiple of voltage (Umin /Acting setting)	Trip time
	> 1.1	No-acting (No-alarm)
	≤ 0.9	Acting (or alarm) as per setting delay time
Alarm return characteristics (Accuracy $\pm 10\%$)	Multiple of voltage (U min /Operating setting)	Acting time
	< 0.9	No return
	≥ 1.1	Return as per alarm return delay setting time
Over-voltage protection/Alarm 3M/3H type		
Performance mode	Close / Trip / Alarm	
Protection/Alarm start setting	Return value ~1200 (v)	
Protection acting delay time setting	0.2~60 (s)	
Alarm acting return setting	100 (v) ~ Start value	Performance mode is alarm for setting this item., Return value $\geq$ start value
Alarm return delay time	0.2~60 (s)	
Protective characteristics (Accuracy $\pm 10\%$)	Multiple of voltage (U min /Acting setting)	Trip time
	< 0.9	No-acting (No-alarm)
	≥ 1.1	Acting (or alarm) as per setting delay time
Alarm return characteristics (Accuracy $\pm 10\%$)	Multiple of voltage (U min /Return setting)	Acting time
	≥ 1.1	No return
	≤ 0.9	Return as per alarm return delay setting time
Voltage asymmetric protection/Alarm 3M/3H type		
Performance mode	Close / Trip / Alarm	
Protection/Alarm start setting	2%~30%	
Protection acting delay time setting	0.2~60 (s)	
Alarm acting return setting	2%~ Start value	Performance mode is alarm for setting this item., Return value $\geq$ start value
Alarm return delay time	0.2~60 (s)	
Protective characteristics (Accuracy $\pm 10\%$)	Actual voltage asymmetric rate/ setting	Trip time
	< 0.9	No-acting (No-alarm)
	≥ 1.1	Acting (or alarm) as per setting delay time
Alarm return characteristics (Accuracy $\pm 10\%$)	Actual voltage asymmetric rate/ setting	Acting time
	> 1.1	No return
	≤ 0.9	Return as per alarm return delay setting time

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Controller Setting and Protective Characteristics

Under-frequency, Over-frequency/Alarm 3M/3H type					
Performance mode		Close / Trip / Alarm			
Under-frequency	Protection/Alarm start setting		45 (Hz) ~ Return value		
	Acting delay time setting		0.2~5.0 (s)		
	Alarm acting return setting		Start value ~65(Hz)	Performance mode is alarm for setting this item m _u , Return value ≥ start value	
	Alarm return delay time setting		0.2~36 (s)		
Over-frequency	Protection/Alarm start setting		Return value ~65 (Hz)		
	Acting delay time setting		0.2~5.0 (s)		
	Alarm acting return setting		45(Hz)~Start value	Performance mode is alarm for setting this item _u , Return value ≥ start value	
	Alarm return delay time setting		0.2~36 (s)		
Protection/Alarm acting characteristics		Same as under-voltage, over-voltage protection/Alarm			
Reverse power protection/Alarm 3M/3H type					
Performance mode		Close / Trip / Alarm			
Protection/Alarm start setting		5~500 (kW)			
Protection acting delay time setting		0.2~20 (s)			
Alarm acting return setting		5 (kW) ~ Start value	Setting this item while only performance mode is alarm _u , Return value ≥ start value		
Alarm return delay time		1.0~360 (s)			
Protection/Alarm operating characteristics		Same as over-voltage protection/Alarm			
Phase sequence /Alarm 3M/3H type					
Performance mode		Close / Trip / Alarm			
Acting sequence setting range		△ φ: A,B,C / △ φ: A,C,B			
Acting/Alarm characteristics		Instantaneous			
Load monitor 2M/2H type & 3M/3H type					
2M/2H type	Current setting IC1、 IC2		(0.2~1) In or OFF (OFF-function close)		
	Time setting		15,20,25,30,40,50,60,80,100,120,160,200,240,320,400,480 (s)		
	Output characteristics (Accuracy±10%)	Load monitor mode		Multiple of current	Acting time
		Model1(Independent control two branches load)	≤ 1.05IC1 or IC2		No operation
			> 1.2 IC1 or IC2		Delay replay operating (same as over-load long delay characteristics curve)
		Mode 2 (Control the same branch load, require IC1 > IC2)	≤ 1.05 IC1		No operation
			> 1.2 IC1		Delay relay operating (same as over-load long delay characteristics curve)
			< IC2		Delay relay operating (delay fixed 60s)
	Thermal memory time		30min (OFF) or power failure release		
	3M/3H type	Operating mode		Current setting	Time setting
Discharge I		Current mode 1	(0.2~1.0) In	(20%~80%) TR (TR: over-load long delay acting time)	
		Current mode 2			
		Power mode 1	200~10000 (kW)	10~3600 (s)	
		Power mode 2			
Discharge II		Current mode 1	(0.2~1.0) In	(20%~80%) TR (TR: over-load long delay acting time)	
		Current mode 2			0.2In~ Discharge I
		Power mode 1	200~10000 (kW)	10~3600 (s)	
	Power mode 2	100 (kW) ~ Discharge I			



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Controller Setting and Protective Characteristics

Signal unit (for selection) 2M/2H type & 3M/3H type

2M/2H type controller Close / Trip / Alarm

Controller type	Contact 1	Contact 2	Contact 3	Contact 4
2M	Load monitor 1 Discharge output	Load monitor 2 Discharge output	Alarm for system self-diagnostic fault alarm	Alarm for fault to trip
2H	Load monitor 1 Discharge output	Load monitor 2 Discharge output	Remote control opening	Remote control closing
Output function for signal contacts (Programmable)	1.Alarm for short-circuit instantaneous fault to trip 2.Alarm for grounding fault or Residual current fault to trip 3.Alarm for .current asymmetric fault to trip 4.Alarm for short-circuit delay fault to trip 5.Alarm for over-load long delay fault to trip 6. Alarm for fault to trip 7. Load monitor 1 Discharge output 8. Load monitor 2 Discharge output 9.Alarm for system diagnostic fault 10.Alarm for power grid fault status			

3M/3H type controller

Function setting	In the drop- list for Switch output (DO) parameter				
Performance mode	Normally open level		Normally close level	Normally open impulse	Normally close impulse
Impulse time	/			1-360 (s)	
Switch variable output (DO) parameter setting	General	Alarm	Fault to trip	Self-diagnostic alarm	Load monitor 1
	Load monitor 2	Over-load prereport	Over-load fault	Short delay fault	Instantaneous fault
	Grounding/ Leakage fault	Grounding fault	Asymmetric current fault	Neutral phase fault	Under-voltage fault
	Over-voltage fault	Voltage asymmetric fault	Under-frequency fault	Over-frequency fault	Allowable-value fault
	Reverse power fault	Regional interlock	Closing	Opening	Phase sequence fault
	MCR/HSISC fault	Grounding interlock	Short-circuit interlock	A phase allowablevalue fault	B phase allowablevalue fault
	C phase allowablevalue fault	N phase allowable-value fault	Allowable-value threshold		

Controller Factory Setting (Approval)

Protection characteristics		Setting current	Setting time	Remarks
Over-load long delay		1.0In	30s	Thermal memory (ON-30ms)
Short-circuit short delay	Inverse time	4Ir	/	-
	Definite time	6Ir	0.2s	
Short-circuit instantaneous		10In	-	-
Neutral protection		100%In	-	-
Grounding protection	In ≤ 1250A	0.8In	Alarm no trip	-
	In ≥ 1600A	1200A		
Asymmetry current		OFF	-	The user open by themselves according to their request



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Controller Setting and Protective Characteristics

Over-load long delay protective operating delay table C1-C163M/3H type

Curre type	Fault current	Delay time(s)															
		C1	C2	C3	C4	C5	C6	C7	C8	C9	C10	C11	C12	C13	C14	C15	C16
SI	1.5lr	0.61	0.98	1.47	2.46	3.68	4.91	6.14	8.29	11.1	17.2	24.6	36.8	49.1	61.4	73.7	86
	6lr	0.14	0.22	0.33	0.55	0.82	1.1	1.37	2.06	2.47	3.84	5.48	8.22	10	13.7	16.4	19.2
	7.2lr	0.12	0.2	0.3	0.5	0.75	0.99	1.24	1.86	2.23	3.48	4.97	7.45	9.93	12.4	14.9	17.4
VI	1.5lr	2	3.2	4.8	8	12	16	20	27	36	56	80	120	160	200	240	280
	6lr	0.2	0.32	0.48	0.8	1.2	1.6	2	2.7	3.6	5.6	8	12	16	20	24	28
	7.2lr	0.16	0.26	0.39	0.65	0.97	1.29	1.61	2.18	2.9	4.52	6.45	9.68	12.9	16.1	19.4	22.6
EI(G)	1.5lr	8	12.8	19.2	32	48	64	80	108	144	224	320	480	640	800	960	1120
	6lr	0.29	0.46	0.69	1.14	1.71	2.29	2.86	3.86	5.14	8	11.4	17.1	22.9	28.6	34.3	37.1
	7.2lr	0.2	0.32	0.47	0.79	1.18	1.57	1.97	2.66	3.54	5.51	7.87	11.8	15.7	19.7	23.6	25.6
EI(M)	1.5lr	6.22	9.96	14.9	24.9	37.3	49.8	62.2	84	112	174	249	373	498	622	747	871
	6lr	0.28	0.45	0.68	1.13	1.69	2.26	2.82	3.81	5.08	7.9	11.3	16.9	22.6	28.2	33.9	36.7
	7.2lr	0.2	0.31	0.47	0.78	1.17	1.56	1.95	2.63	3.51	5.46	7.8	11.7	15.6	19.5	23.4	25.4
HV	1.5lr	2.46	3.94	5.9	9.85	14.8	19.7	24.6	33.2	44.3	68.9	98.5	147	197	246	295	344
	6lr	0.01	0.01	0.02	0.03	0.05	0.06	0.08	0.1	0.14	0.22	0.31	0.46	0.62	0.77	0.93	1
	7.2lr	0	0.01	0.01	0.02	0.02	0.03	0.04	0.05	0.07	0.1	0.15	0.22	0.3	0.37	0.45	0.48
I2t	1.5lr	15	30	60	120	240	360	480	600	720	840	960					
	6lr	0.938	1.875	3.75	7.5	15	22.5	30	37.5	45	52.5	60					
	7.2lr	0.651	1.302	2.604	5.208	10.4	15.6	20.8	26.0	31.3	36.5	41.7					

Controller service power supply

Instrument transformer and auxiliary power supply for controller service source, so as to ensure normal operation for low current or normal breaking for fault by means of 1 & 2 power supply modes simultaneously

◆ CT power supply

Normal service conditions for controller: Primary single phase current no less than $0.4I_n$. Three-phase no less than $0.2I_n$. Rated current $\leq 400A$. Main circuits primary current no less than $1.0I_n$. Three-phase no less than $0.6I_n$. Otherwise, it shall be connected auxiliary power supply.

◆ Auxiliary power supply

◇ Normal service conditions for controller (85%~110%) U_s

◇ AC voltage (50/60Hz) : AC230V, AC400V, AC110V

◇ DC voltage: DC220V, DC110V, DC24V

◇ Voltage for 1 & 2 contacts of DC controller: DC24V

◇ External DC power module shall convert DC110V/DC220V into DC24V by the user incoming.



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Controller Setting and Protective Characteristics

Category	Name/ Code	Configuration	Mounting construction type	Remarks
Electric control accessories	Closing electromagnet (X)	Standard	Fixed-type/Draw out-type	Alternative
	Shunt release (F)	Standard	Fixed-type/Draw out-type	
	Motor operating mechanism (M)	Standard	Fixed-type/Draw out-type	
	Under-voltage release (Q) / Under-voltage delay module (QY)	For selection	Fixed-type/Draw out-type	
	No-voltage release (Q) / No-voltage delay module (QY)	For selection	Fixed-type/Draw out-type	
Signal output accessories	Auxiliary switch (FK)	Standard	Fixed-type/Draw out-type	
	Drawer base three-position status signal output device	For selection	Draw out-type	
	Secondary terminals	Standard	Fixed-type/Draw out-type	
Controller related accessories	External connecting N pole current transformer (HGQ)	For selection	Fixed-type/Draw out-type	
	Power module (DM)	For selection	Fixed-type/Draw out-type	
	Relay module (RM)	For selection	Fixed-type/Draw out-type	Be used with power module
Protection accessories	Insulating barrier between phases	Standard	Fixed-type/Draw out-type	
	Frame	Standard	Fixed-type/Draw out-type	
Lock and interlock device	Opening position key-lock	For selection	Fixed-type/Draw out-type	
	Button-lock	For selection	Fixed-type/Draw out-type	
	Door interlock	For selection	Draw out-type	
Power supply switching device	Mechanism interlock (Soft/ Hard)	For selection	Fixed-type/Draw out-type	Be used for two circuits power supply



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Electric control accessories

◆ Closing electromagnet

Closing electromagnet shall be made of coil, steel core assembly and electronic component.

Disconnect shall be managed remotely under mechanism energy storage conditions.

Rated insulation voltage(Ui)	Operational voltage range	Rated control voltage Us	Instantaneous power	
			ZQW18-1600	ZQW18-2500,4000
500V	(85%~110%)Us	AC230V(220V)50/60Hz	300VA	300VA
		AC400V(380V)50/60Hz	300VA	300VA
		AC110V	300VA	300VA
		DC220V	135W	135W
		DC110V	135W	135W
		DC24V	70W	70W

◆ Shunt release

Shunt release shall be made of coil, steel core assembly and electronic component.

Disconnect shall be managed remotely.

Rated insulation voltage(Ui)	Operational voltage range	Rated control voltage Us	Instantaneous power	
			ZQW18-1600	ZQW18-2500,4000
500V	(70%~110%)Us	AC230V(220V)50/60Hz	300VA	300VA
		AC400V(380V)50/60Hz	300VA	300VA
		AC110V	300VA	300VA
		DC220V	135W	135W
		DC110V	135W	135W
		DC24V	70W	70W

◆ Motor operating mechanism

Disconnect shall be managed after motor operating mechanism for air circuit breaker prior to energy storage.

Rated insulation voltage(Ui)	Operational voltage range	Rated control voltage Us	Instantaneous power	
			ZQW18-1600	ZQW18-2500,4000
500V	(85%~110%) Us	AC230V(220V)50/60Hz	90W	110W
		AC400V(380V)50/60Hz		
		AC110V		
		DC220V		
		DC110V		

◆ Under-voltage release

Under-voltage release shall include instantaneous release and delay release, which is made of coil, steel core assembly and control unit.

◇ Under-voltage delay release set the release operating delay time through toggle switch inside toggle undervoltage delay device. Delay time setting is 1s, 3s, 5s according to the request and factory default is 1s.

◇ ZQW18-1600 delay time for under-voltage delay release is not adjusted after delivery according to the user request.

◆ Under-voltage release operating characteristics

1) External voltage drop or drop slowly up to 35%~70%Ue, under-voltage release shall discharge for air circuit breaker breaking.

2) External voltage below 35%Ue, air circuit breaker cannot be close for under-voltage release.

3) External voltage is 85%~110%Ue, under-voltage release operating ensure air circuit breaker reliable close.

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Rated insulation voltage (Ui)	Rated service voltage Ue	Operating power	
		ZQW18-1600	ZQW18-2500,4000
500V	AC230V(220V)50/60Hz	0.8VA	3.9VA
	AC400V(380V)50/60Hz	0.8VA	5.2VA
	AC110V	0.8VA	3.9VA
	DC220V	0.8W	3.9W
	DC110V	0.8W	3.9W
	DC24V	1.9W	1.6W

◆ No-voltage release (Under-voltage release---no-voltage protection)

No-voltage release shall include instantaneous release and delay release, which is made of coil, steel core assembly and control unit.

◇ No-voltage delay release set the release operating delay time through toggle switch inside toggle under-voltage delay device. Delay time is 1~5s which the user can adjust. Step is 1s.

◇ No-voltage delay release delay time of ZQW18-1600 cannot be adjusted after delivery, according to the user request.

◆ No-voltage release operating characteristics

- 1) External voltage drop suddenly up to 0~30%Ue, no-voltage release discharge and disconnect air circuit breaker.
- 2) No-voltage release cannot be close air circuit breaker for external voltage below 30%Ue.
- 3) External voltage is 85%~110%Ue, no-voltage release ensure air circuit breaker close reliable.

Rated insulation voltage (Ui)	Rated service voltage Ue	Operating power	
		ZQW18-1600	ZQW18-2500,4000
500V	AC230V (220V) 50/60Hz	0.8VA	0.8VA
	AC400V (380V) 50/60Hz	0.8VA	0.8VA

Signal output accessories

◆ Auxiliary switch

Auxiliary switch parameter

Case		ZQW18-1600	ZQW18-2500	ZQW18-4000
Auxiliary switch mode	Standard	4 gang switching	4 gang switching	4 gang switching
	For selection	6 gang switching	4 normal open 4 normal close 6 normal open 6 normal close 6 gang switching	4 normal open 4 normal close 6 normal open 6 normal close 6 gang switching
Conventional thermal current Ith		6A		
Minimum load		2mA/DC15V		
Breaking capacity	DC-13	5A/DC250V		
	AC-15	16A/AC380V		

◆ Signal output device for drawer base position status

Draw out-type air circuit breaker body is in the position of opening, test, connection, three positions electric indicating device output electric status signal respectively.

Case		ZQW18-1600,2500,4000
	DC	0.4A/DC125V
	AC	16A/AC250V

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◆ Secondary terminals

Draw out-type and fixed secondary terminals parameter in the following table

Case	ZQW18-1600	ZQW18-2500,4000
Numbers of Terminals(total)	60 units	88 units
Level of contamination	3	
Voltage category	III	
Maximum load current	10A	
Rated current	10A	
Rated voltage	500V	

Controller related accessories

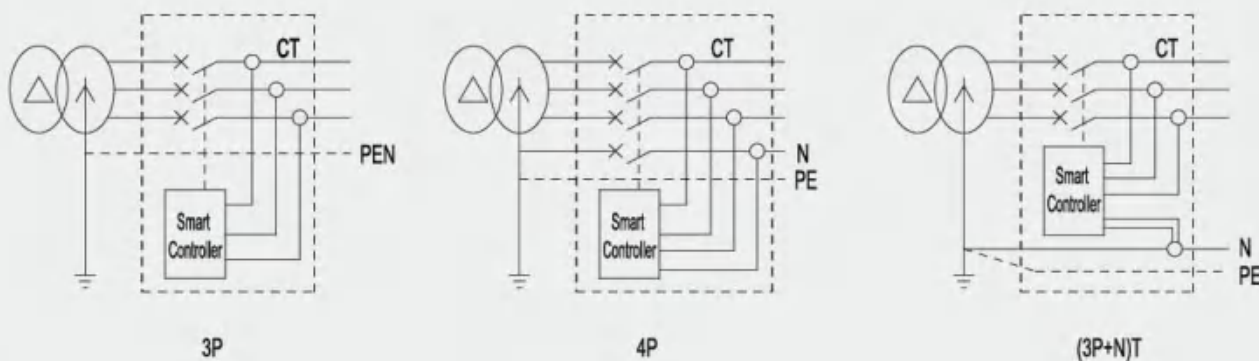
◇ External connection N pole instrument transformer

Grounding mode

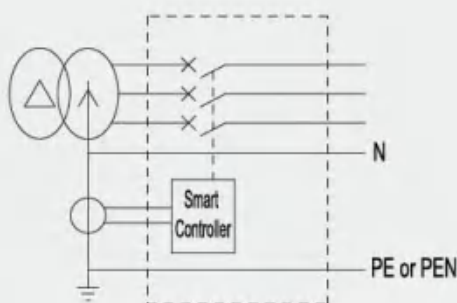
The use of III air circuit breaker with external N phase instrument transformer comprise 3P+N system

enabling grounding protection for differential-type (T) or earth current-type (W). Electric schematic diagram in the following:

Differential-type (T)



Earth current-type (W)

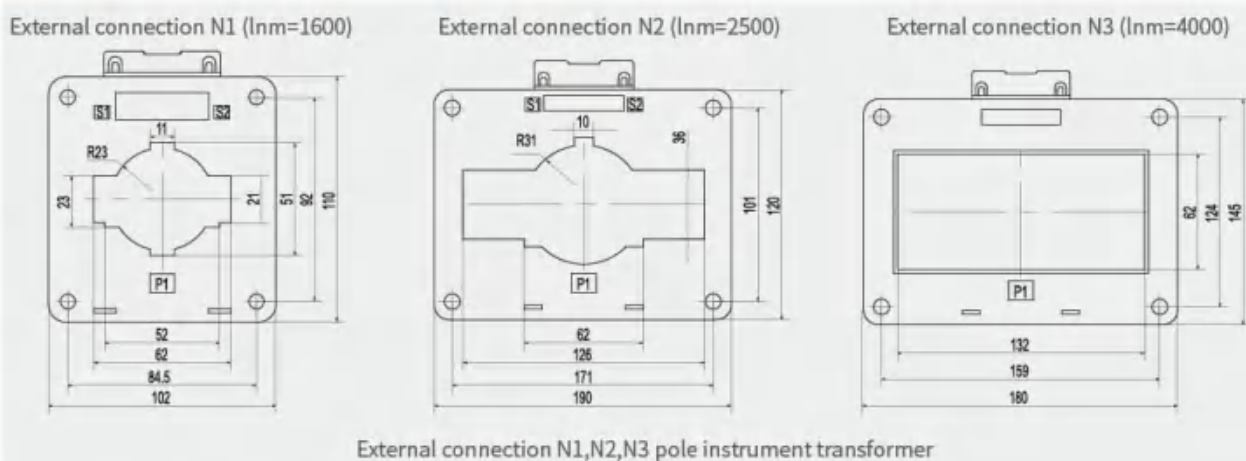


Instrument transformer type:

External connection N pole instrument transformer which is rectangular. Case and bus bar dimension for the user selection.

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Controller Setting and Protective Characteristics



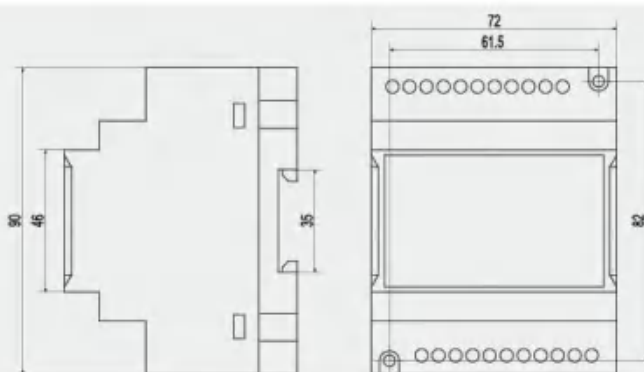
Note: bus bar current incoming from P1 and outgoing from P2.

Power Module

- ◇ Output voltage of DC controller and relay module:DC24V。
- ◇ Category:

Type	Voltage	Size(mm)	Influence of poles connection
DM-P1	AC230V/AC400V	90x72x54	Influence of non-pole
DM-P2	DC220V/DC110V	90x72x54	Influence of pole
DM-P3	AC110V	90x72x54	Influence of non-pole

- ◇ Characteristics: (85%~110%) Us power module normal working
- ◇ Mounting mode: by means of 35mm standard rails or screw fixed
- ◇ Connection by themselves according to rated service voltage
- ◇ Overall and Mounting dimension drawing:



Relay module

- ◇ Air circuit breaker open, close or larger load capacity , relay module shall be equipped with power module to enable four distance functions through this module switching to control.
- ◇ Contacts capacity: AC250V,10A; DC24V,10A;
- ◇ Overall and Mounting: Same as power module

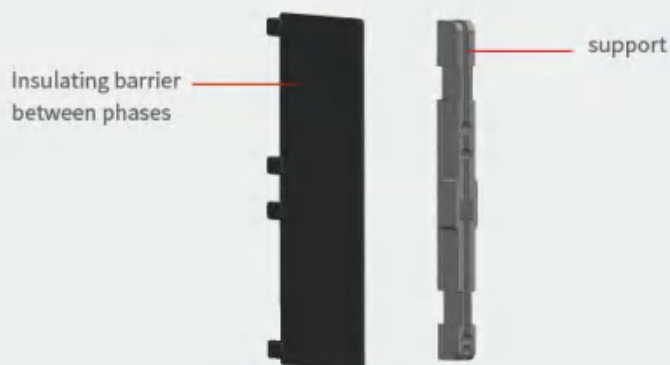


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Protective accessories

◇ Insulating barrier between phases

Insulating barrier between phases shall include fixed-type and draw out-type, which shall be fitted to the groove between each phase and bus-bar for adding electric insulation strength between main circuits and phases.



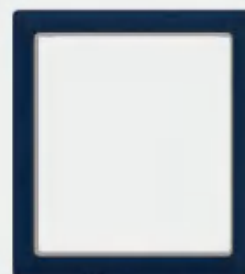
Remarks: Fixed-type air circuit breaker is fitted with the support before installation insulating barrier. between phases

◇ Frame

Case shall include fixed-type and draw out-type, which is fitted to the door of cabinet for sealing. The degree of protection for air circuit breaker shall be IP40. Air circuit breaker shall be compact, rugged and reliable in design.



Draw out-type



Fixed-type

Lock & Interlock device

◆ Disconnection position key-lock



Key-lock shall be fitted to lock air circuit breaker in manual opening position. Circuit breaker cannot be close operation for locking clockwise with the key.

Type	Name	Qty of circuit breaker	Qty of key
YS11	One lock with one key	1	1
YS21	Two locks with one key	2	1
YS31	Three locks with one key	3	1
YS32	Three locks with two keys	3	2
YS53	Five locks with three keys	5	3

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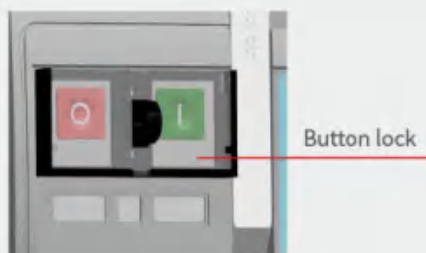
Lock & Interlock device

◆ Button lock

- ◇ Air circuit breaker shall be equipped with a locking system to avoid non-operator operating open/close button.
- ◇ Provide the lock by the user

◆ Door interlock

Door interlock shall be fitted to the right or left side of drawer base to avoid open the small door of cabinet in the nodisconnect position for drawer-type air circuit breaker.



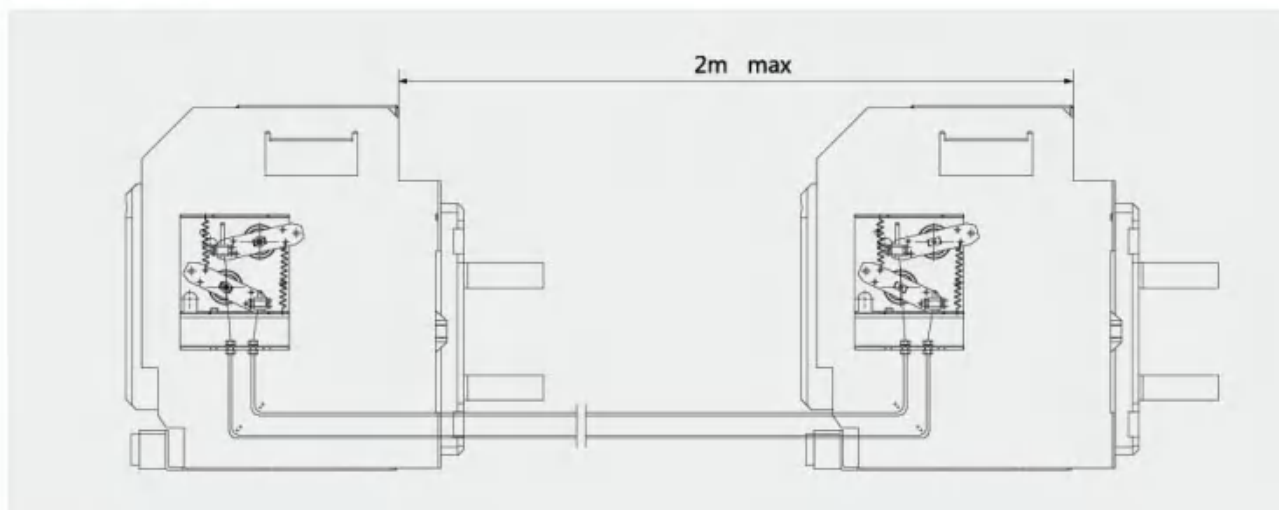
Power supply switching device

◆ Mechanical interlock

- ◇ Mechanical interlock mechanism shall be suitable for interlock between draw out-type or fixed-type air circuit breaker.
- ◇ Interlock mechanism is fixed on the right side panel of air circuit breaker with 4 screws by the user.
- ◇ Maximum distance between two air circuit breakers with mechanism interlock no more than 2m.
- ◇ Interlock type in the following table:

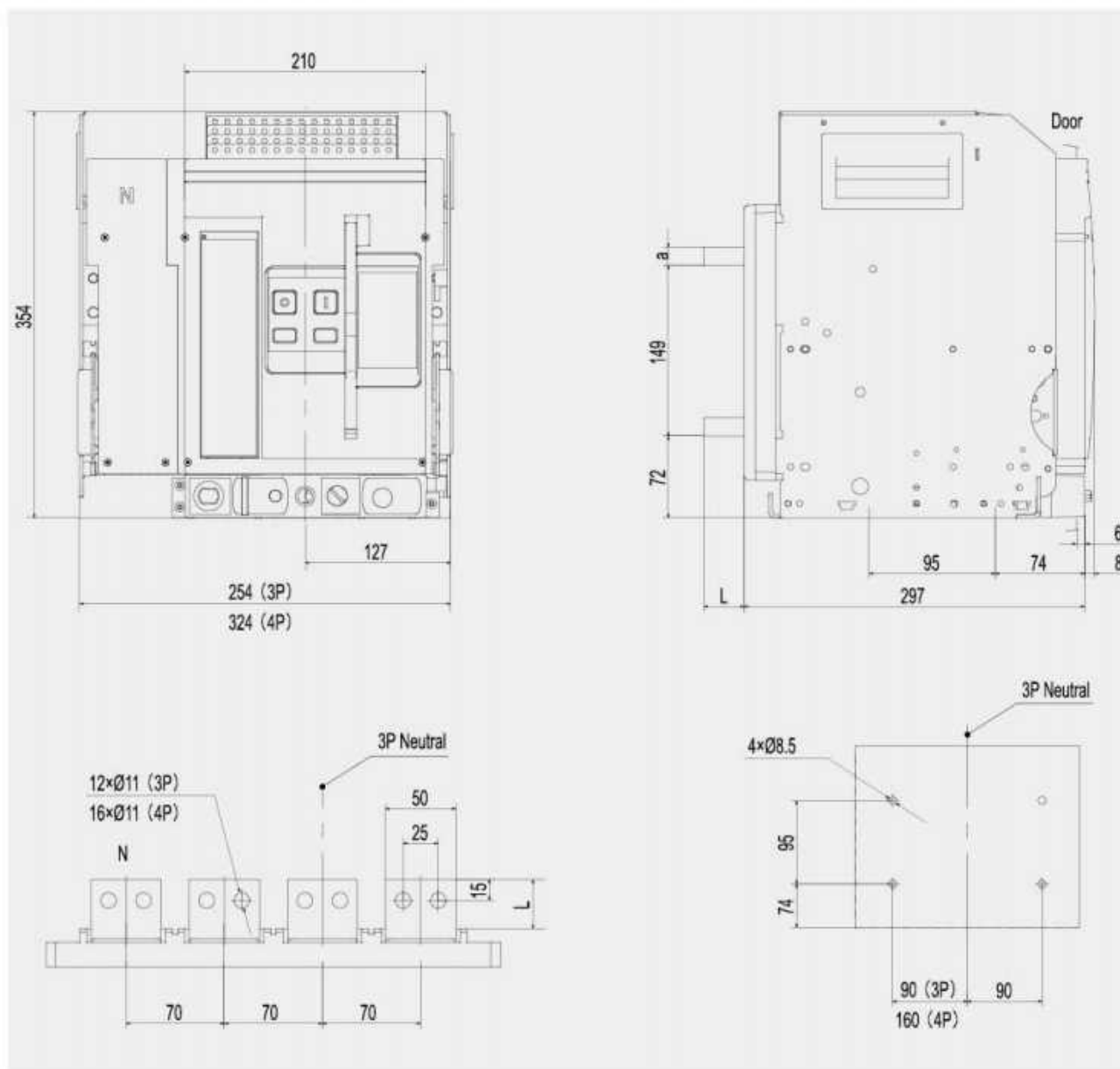
Mode for selection	Type	Qty of circuit breaker
1	Two sets soft interlock, one close one open	2
2	Three sets soft interlock, one close two open	3
3	Three sets soft interlock, two close two open	3
4	Two sets hard interlock, one close one open	2
5	Three sets hard interlock, one close two open	3

◆ Mounting drawing:



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ZQW18-1600 Draw out-type



Rated current (A)	a (mm)	L (mm)
200~800	5	Normal: 35 (default) Extend: 50
1000~1250	10	
1600	16	

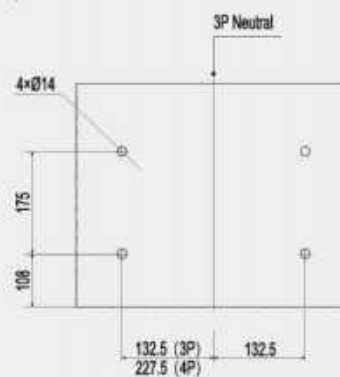
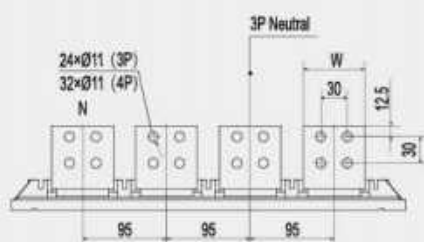
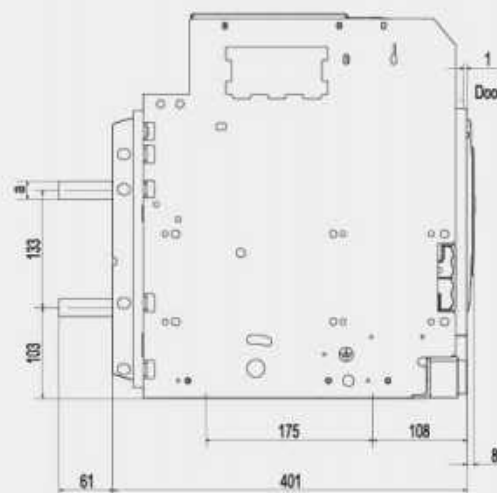
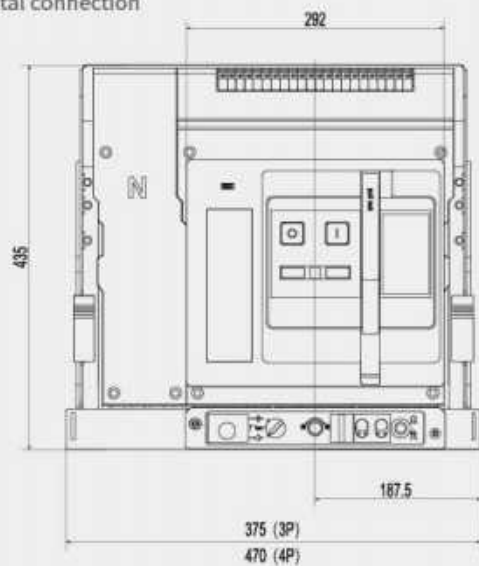
ZQW18-1600 Draw out-type



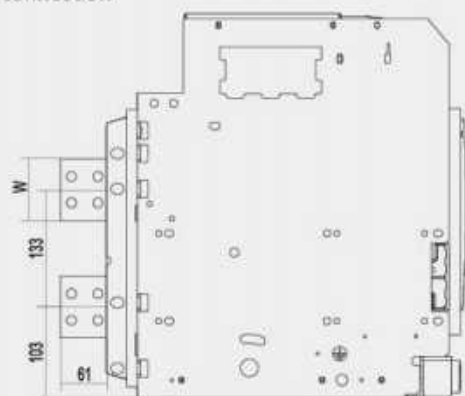
ZQW18-1600
Intelligent universal circuit breaker

ZQW18-2500 Draw out-type

Horizontal connection



Vertical connection

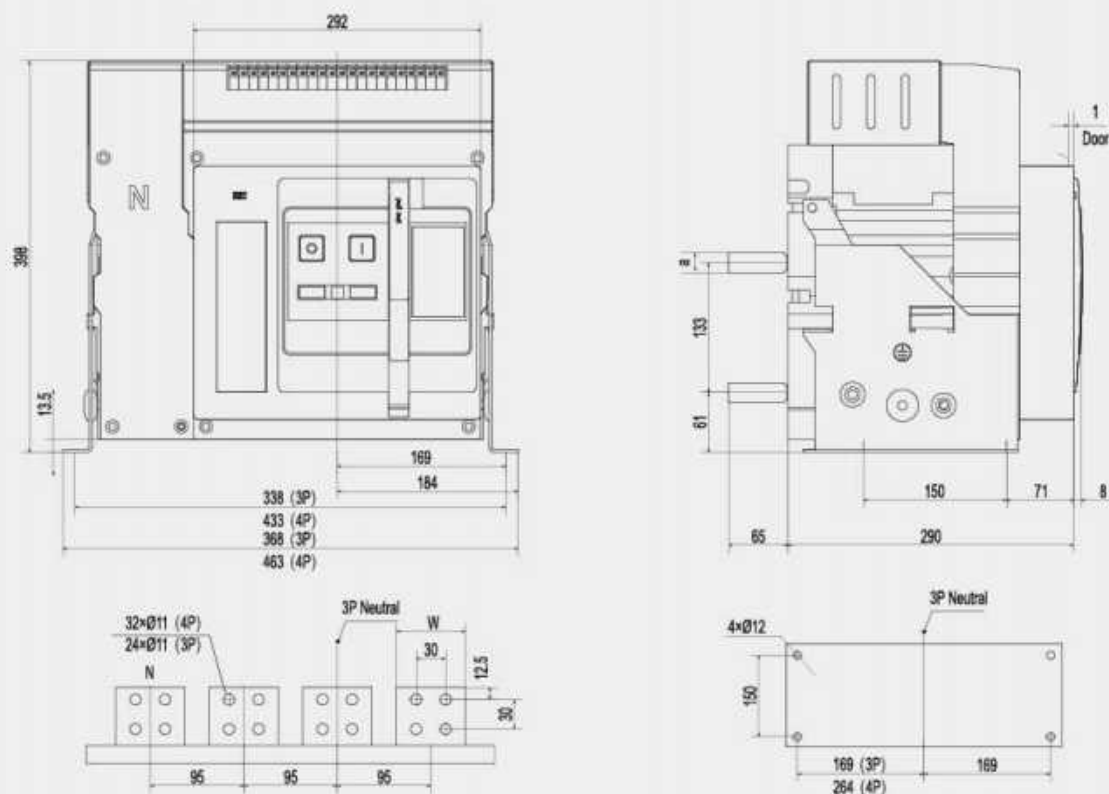


Rated current (A)	a (mm)	w (mm)
630-1600	15	60
2000-2500	20	70

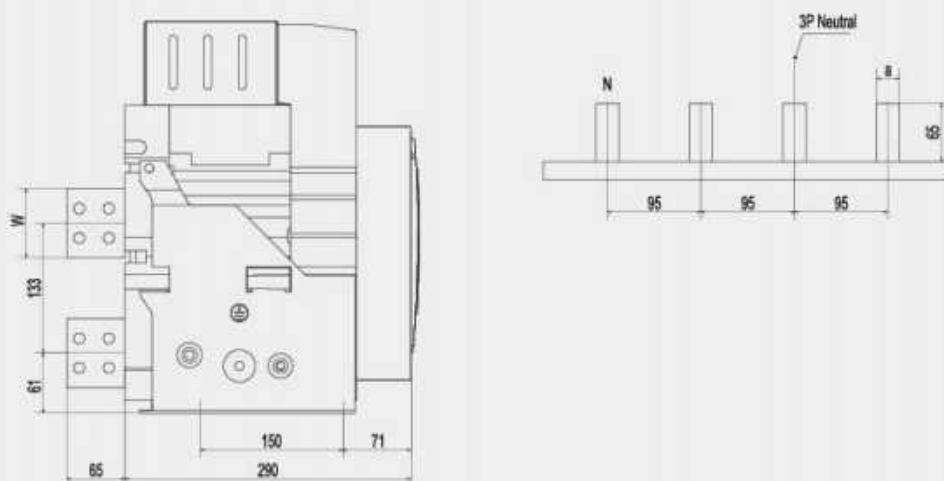
ZQW18-1600
Intelligent universal circuit breaker

ZQW18-2500 Fixed-type

Horizontal connection



Vertical connection



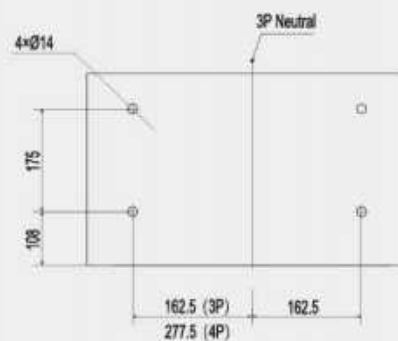
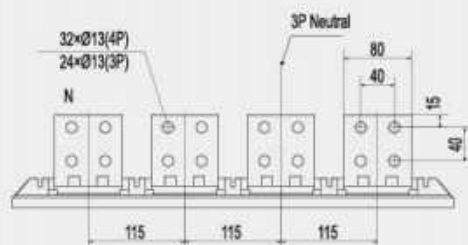
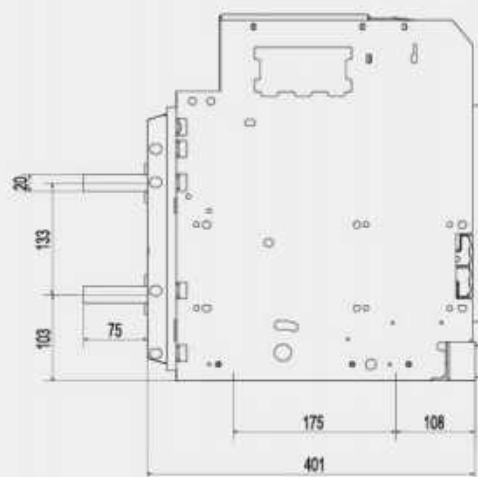
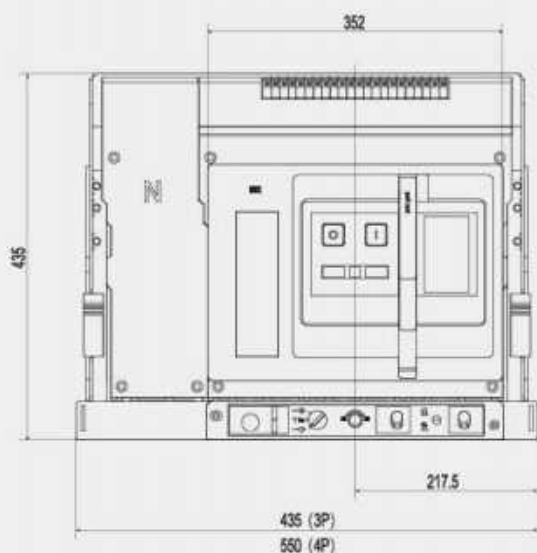
Rated current (A)	a (mm)	w (mm)
630-1600	14	60
2000-2500	20	70



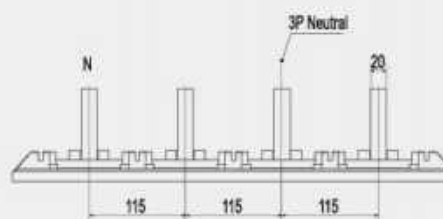
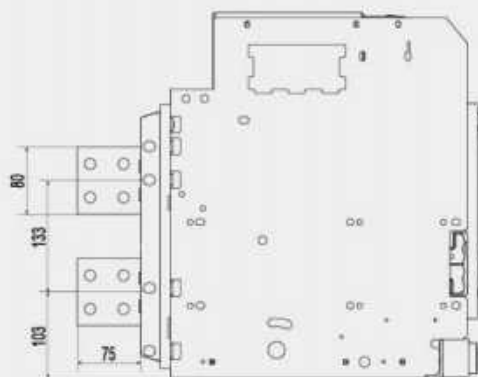
ZQW18-1600
Intelligent universal circuit breaker

ZQW18-4000 Draw out-type

Horizontal connection (In=2000-3200A)

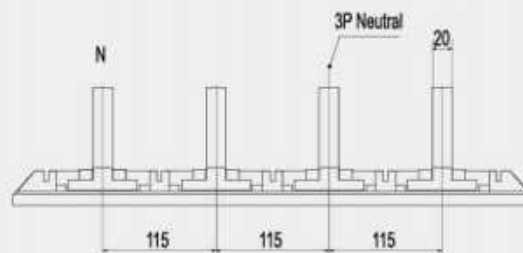
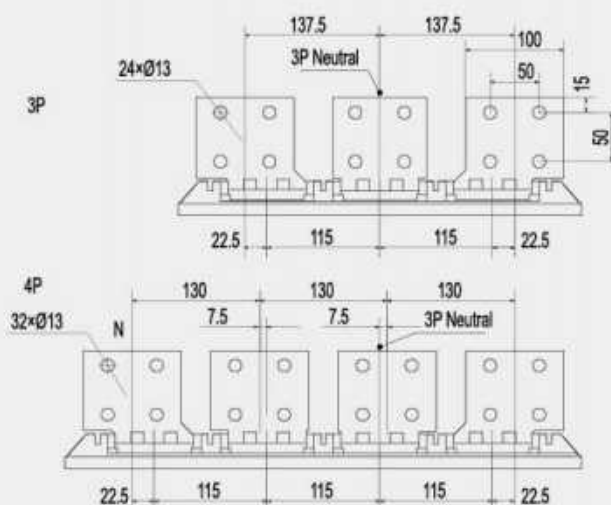


Vertical connection (In=2000-3200A)



ZQW18-4000 Draw out-type

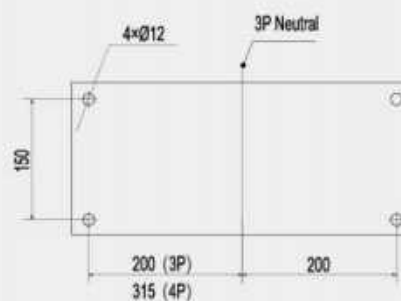
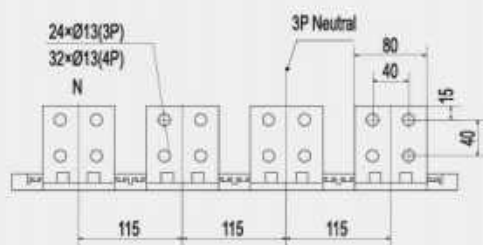
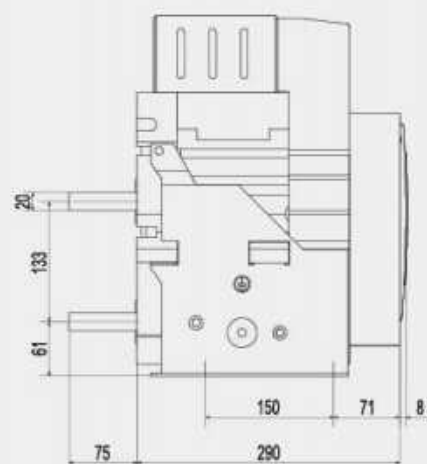
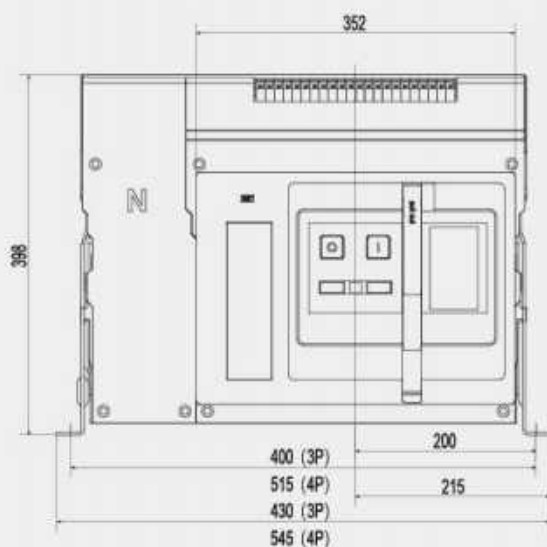
Technical drawing of the front view of a machine. The drawing shows a complex mechanical structure with various components and dimensions. The dimensions are: 20 (vertical), 133 (vertical), 103 (vertical), and 85 (horizontal).



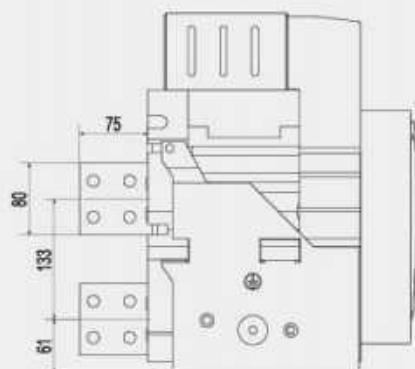
ZQW18-1600
Intelligent universal circuit breaker

ZQW18-4000 Fixed-type

Horizontal connection (In=2000-3200)



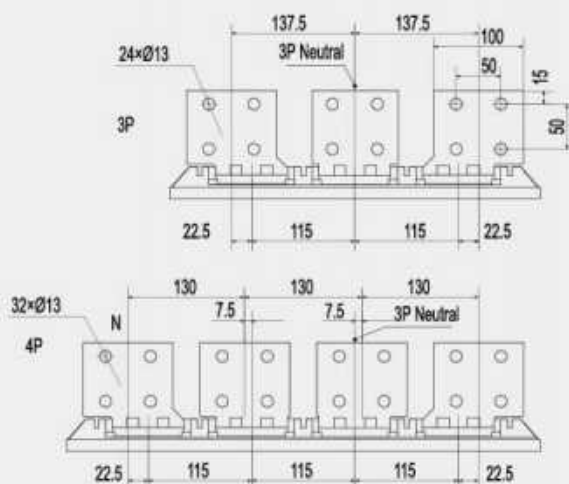
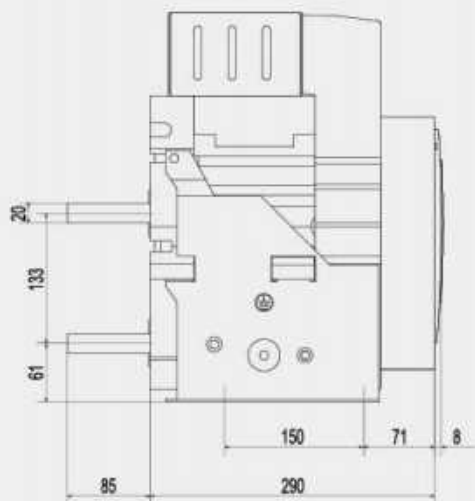
Vertical connection (In=2000-3200)



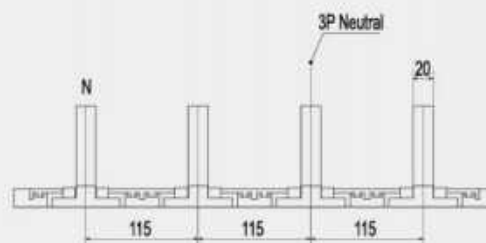
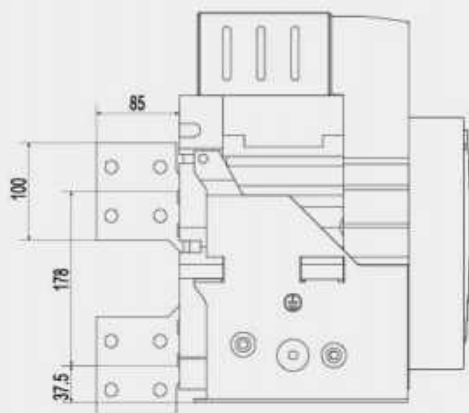
ZQW18-1600
Intelligent universal circuit breaker

ZQW18-4000 Fixed-type

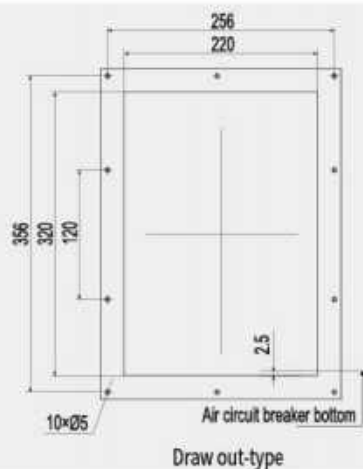
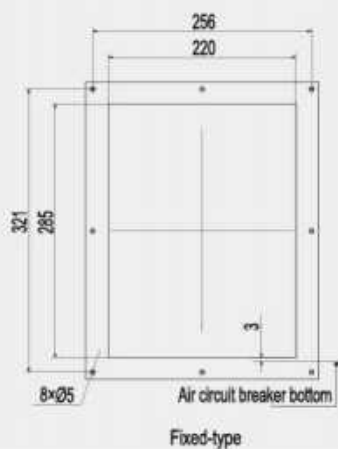
Horizontal connection (In=3600~4000)



Vertical connection (In=3600~4000)



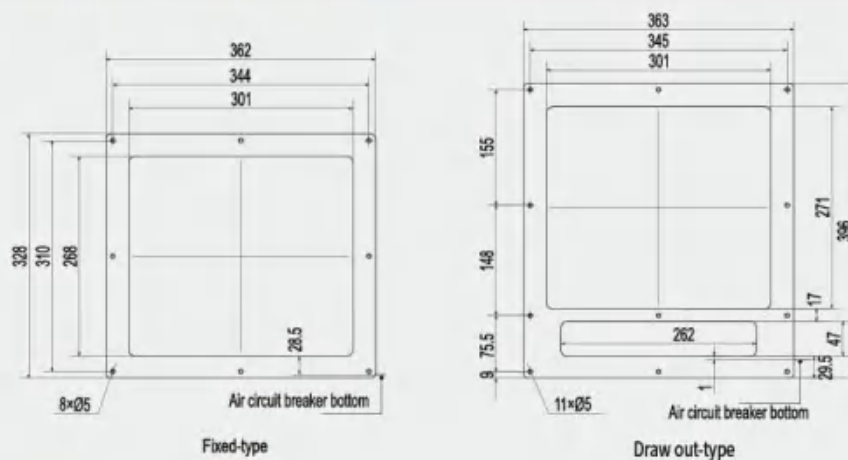
ZQW18-1600 bore diameter for frame



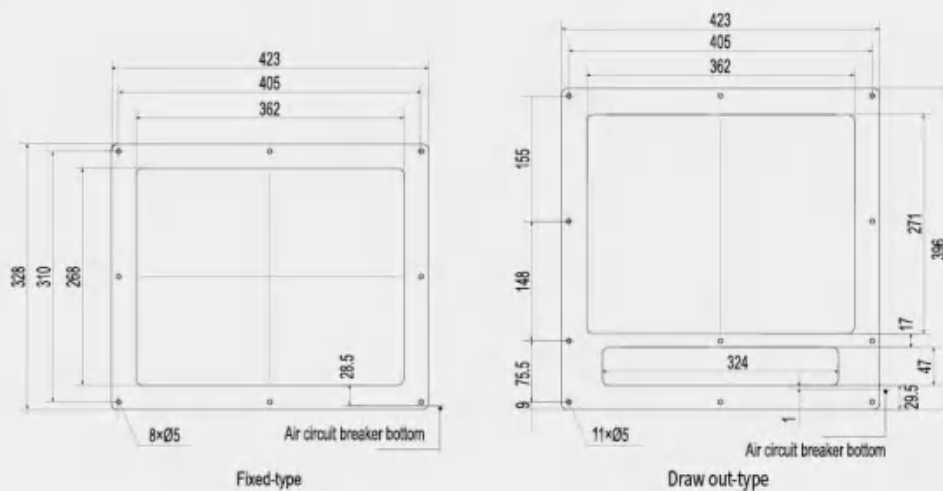


ZQW18-1600 Intelligent universal circuit breaker

ZQW18-2500 bore diameter for frame



ZQW18-4000 bore diameter for frame



Notes:

To ensure the safety of personnel and equipment before air circuit breaker operation, clause-by-clause compliance in the following:

- 1) To read the instruction carefully before mounting and use of air circuit breaker.
- 2) To check air circuit breaker specification before use of air circuit breaker.
- 3) To test insulation resistance of air circuit breaker with 1000V megger. Ambient temperature 20 ± 5 °C, relative humidity 50~70% no less than 10 MΩ.
- 4) During installation against dust, water, and vermin dropping into air circuit breaker.
- 5) Mounting conductor bus-bar in air circuit breaker shall be symmetric without additional mechanical stress.

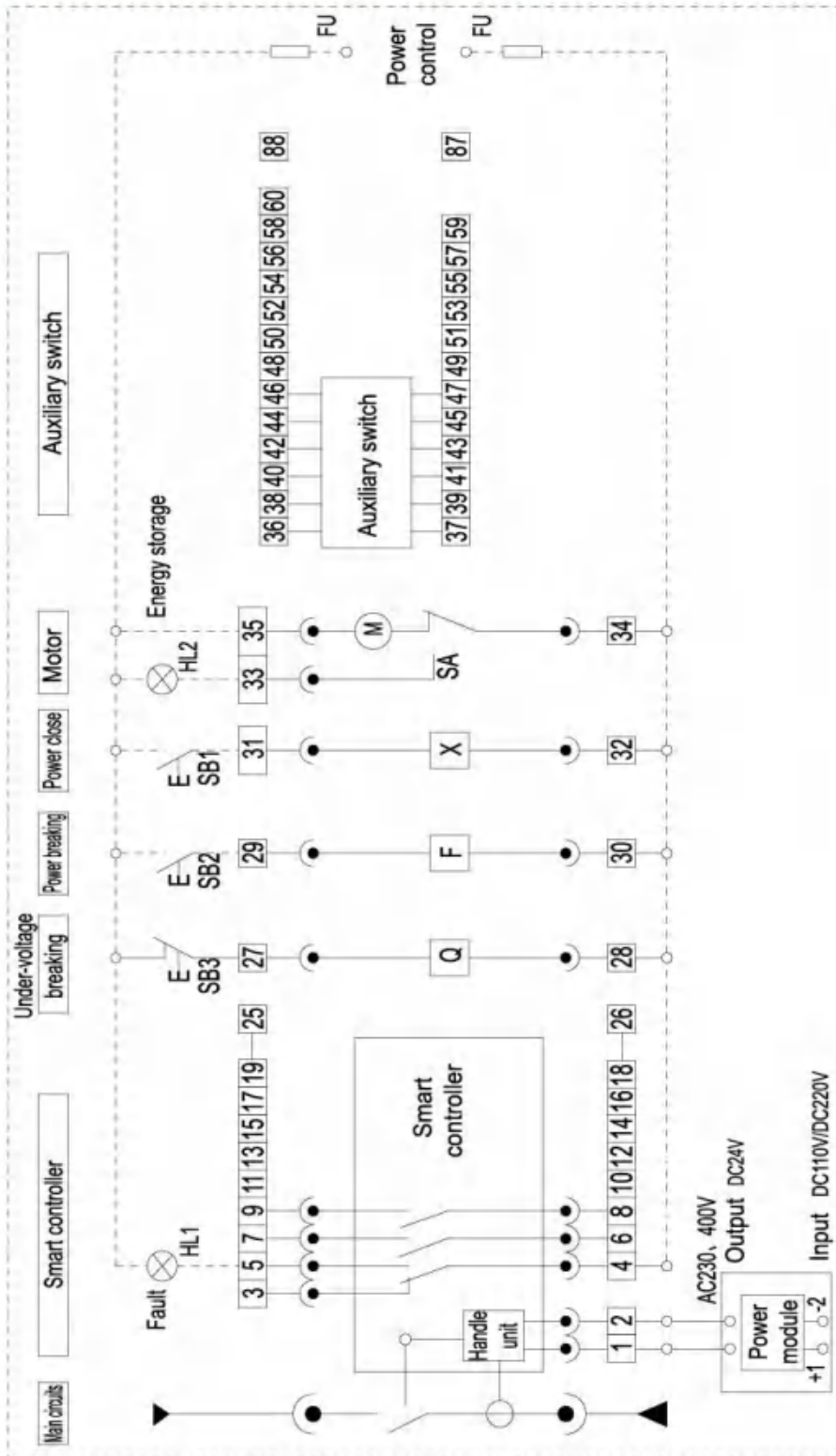
6) Mounting air circuit breaker shall be reliable grounding with clear grounding marking.

7) Mounting air circuit breaker shall control circuits connection as per connection diagram and check working voltage and actual voltage of shunt, open/close electromagnet, motor, controller, then secondary circuit on power.

ZQW18-1600

Intelligent universal circuit breaker

M type controller connection diagram



1,2: Power supply is direct current, which add supply module.

3,4,5: Signal contacts for release fault to trip indicating, 4 is common terminal.

6,7,8,9,10,11: Two sets auxiliary signal contacts (additional for selection),

6,9 is common terminal.

12,13: Group 1 controller signal outgoing terminal (additional for selection)

14,15: Group 2 controller signal outgoing terminal (additional for selection)

16,17: Group 3 controller signal outgoing terminal (additional for selection)

18,19: Group 4 controller signal outgoing terminal (additional for selection)

20: Controller grounding

21,22,23,24: N,A,B,C phase voltage signal incoming (additional for selection)

25,26: External connection N pole or incoming terminal of earth current transformer

27,28: Under-voltage release

29,30: Shunt release

31,32: Closing electromagnet

33,34,35: Motor operation mechanism, 34: Common terminal

Q,F,X,M: Under-voltage release, Shunt release, Closing electromagnet, Motor operation mechanism

HL1,HL2: Fault to trip indicating, Motor energy storage fulfill indicating (Provide by the user)

SB1,SB2,SB3: Close, Open, Under-voltage button

(Provide by the user /Under-voltage can be short connection)

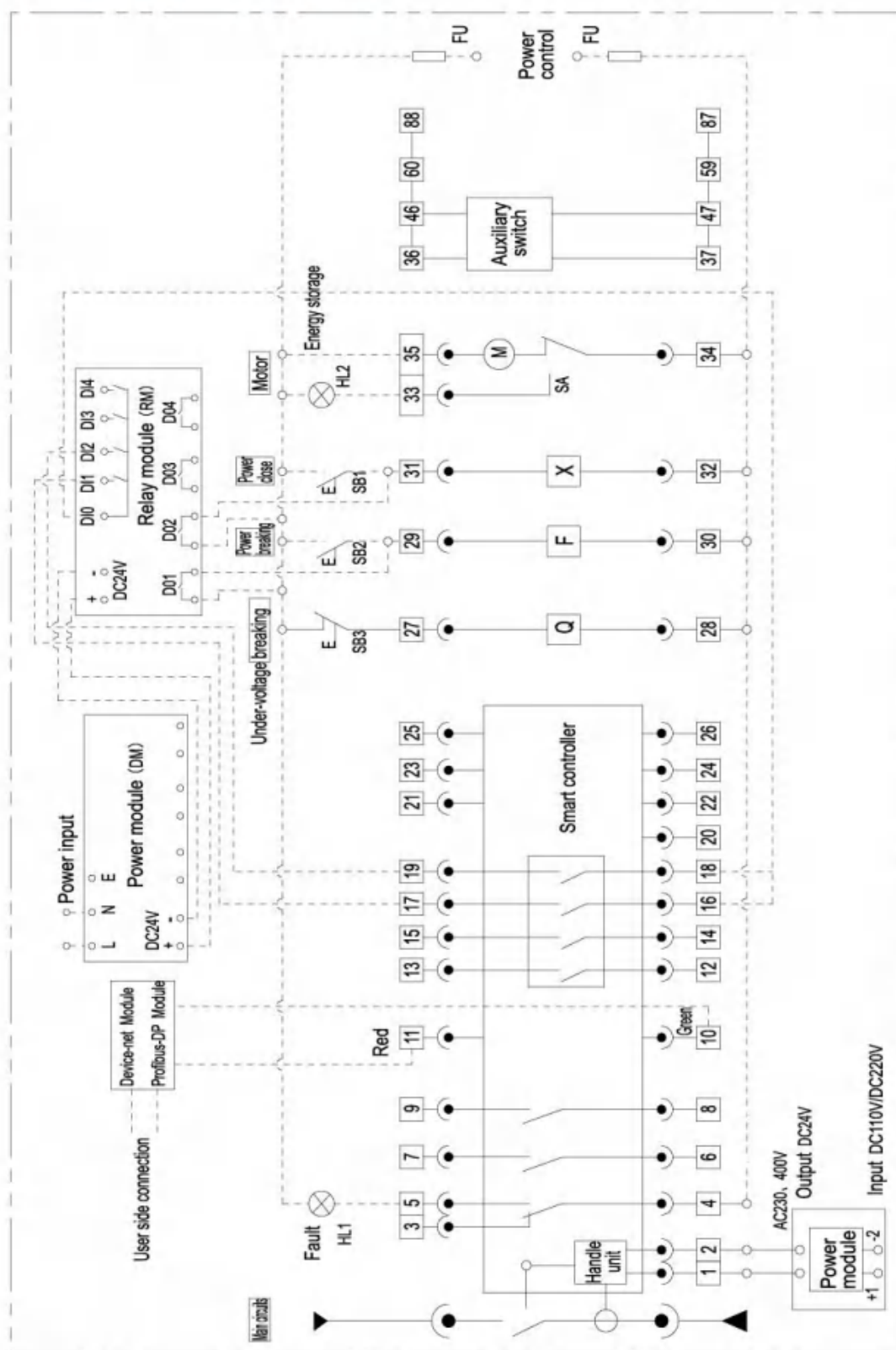
SA,FU: Motor travel switch (with the motor), Fuse (Provide by the user)



ZQW18-1600

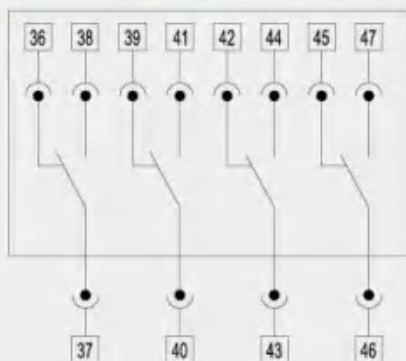
Intelligent universal circuit breaker

H type controller connection diagram

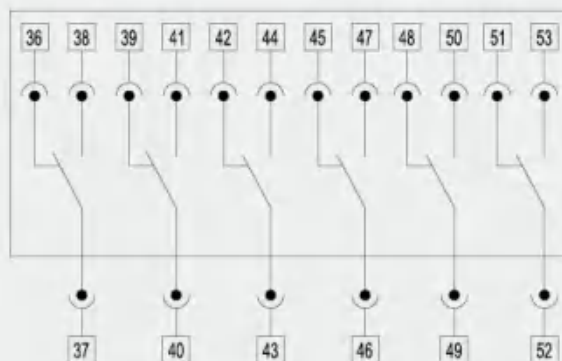


ZQW18-1600
Intelligent universal circuit breaker

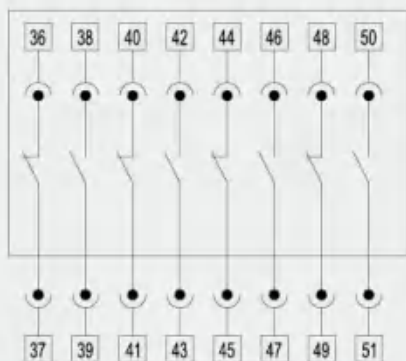
Auxiliary switch connection diagram



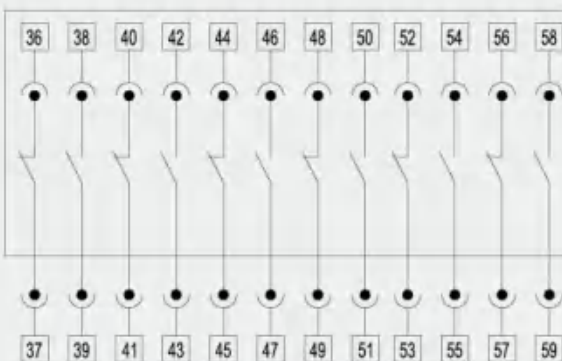
4 gang switching



6 gang switching



4 normal open 4 normal close



6 normal open 6 normal close

Remarks:

1,2: Auxiliary power supply incoming terminals for smart controller Auxiliary power supply is DC, which add the power supply module

3,4,5: Signal contacts for release fault to trip indicating,4 is common terminal

6,7: Air circuit breaker opening indicating

8,9: Air circuit breaker closing indicating

10,11: Communication interface

12,13: Load monitor 1(Default)

14,15: Load monitor 2 (Default)

16,17: Opening signal output

18,19: Closing signal output

20: Controller grounding

21,22,23,24: N,A,B,C Phase voltage signal input

25,26: External connection N pole or CT input terminal

27,28: Under-voltage release or no-voltage release

29,30: Shunt release

31,32: Close electromagnet

33,34,35: Motor operation mechanism.34 is common terminal34

36 ~ 47: Auxiliary switch

Q,F: Under-voltage release and Shunt release,

X,M: Close electromagnet and Motor operation mechanism.

HL1,HL2: Fault to trip indicating and Motor energy storage finish indicating(Provided by the user)

Circuit breaker

SB1,SB2,SB3: Closing, Opening and Under-voltage button (Provided by the user)

SA:Motor travel switch with the motor

FU:Fuse(Provided by the user)



Striving for perfection is the driving force that we have been insisting on. Grasp every detail to make the product more perfect.



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Intelligent universal circuit breaker

Molded case circuit breaker

Intelligent molded case circuit breaker

Leakage molded case circuit breaker

Miniature circuit breaker

Self-resetting overvoltage and undervoltage

dual power switch

Load disconnecter

Contactor thermal relay

Branch/busbar

ZQMS

Molded case circuit breaker (with lock)



ZQMS

Molded case circuit breaker (with lock)

Product overview

- ◇ ZQMS series molded case circuit breakers are improved on the basis of ZQM1. At present, there are five frame grades of 125, 250, 400, 630 and 800. The rated current ranges from 16A to 800A. This series of products has locking function, which can ensure the danger caused by unauthorized closing of the circuit breaker in the open state; Cage type terminal blocks greatly ensure the reliability of wiring. The specially designed terminal cover can reach the protection level of P30, which can effectively prevent touching live parts during operation.
- ◇ EC60947-2 GB14048.2.
- ◇ ZQMS is composed of ZQM1 circuit breaker (#3) protective cover/terminal cover (#1) lock assembly (#5), and its performance is exactly the same as that of the ordinary circuit breaker ZQM1, which prevents the protected object from being damaged due to overload short circuit fault. The difference is that ZQMS, under the effect of the lock assembly, causes the danger of unauthorized closing after the circuit breaker is disconnected. If the circuit breaker needs to be closed, all components must be placed in the unlocked position to make it closed, otherwise the circuit breaker can not be closed.
- ◇ The working principle of ZQMS is as follows: when the circuit breaker is in the closing state, press the tripping button to open the circuit breaker No. 4. When the lock component is in the locking state, the circuit breaker can not be closed without authorization. When the lock component is in the unlocking state, the circuit breaker can open and close freely. The design intent is to protect the maintenance personnel from the accidental danger caused by the misoperation of non maintenance personnel during the actual operation of the circuit breaker, At the same time, during equipment commissioning and operation, avoid damage to equipment caused by misoperation of non equipment operators.

Note: The technical parameters of this product are the same as those of ZQM1 molded case circuit breaker.

Structure diagram

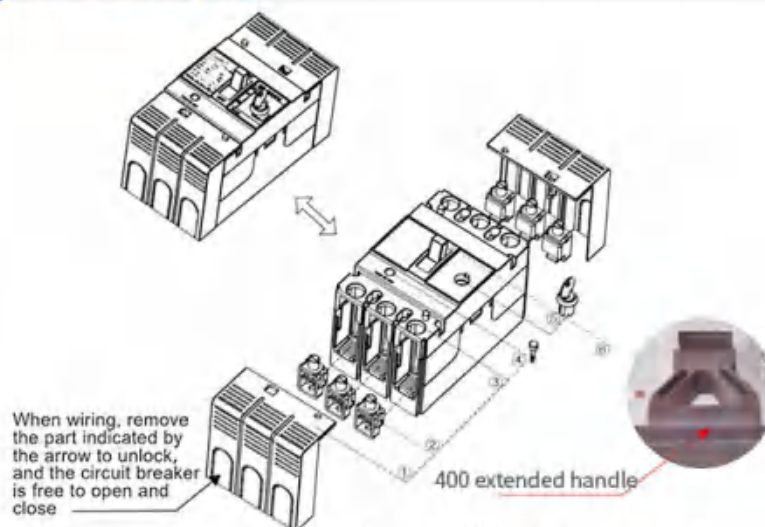


Figure 1: ZQMS mechanism diagram

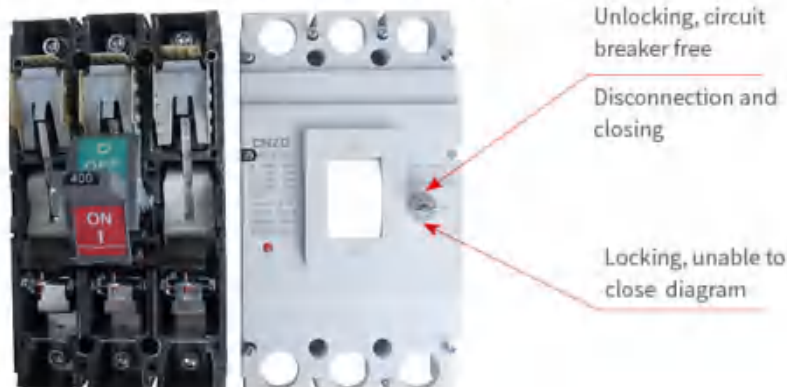


Figure 2: Entity structure of ZQMS

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Intelligent universal circuit breaker

Molded case circuit breaker

Intelligent molded case circuit breaker

Leakage molded case circuit breaker

Miniature circuit breaker

Self-resetting overvoltage and undervoltage

dual power switch

Load disconnect

Contact thermal relay

Branch/busbar

ZQM1

Molded case circuit breaker



ZQM1

Molded case circuit breaker



Product overview

- ◇ ZQM1 series plastic case circuit breaker (hereinafter referred to as circuit breaker) is one of the new circuit breakers developed by our company with international advanced design and manufacturing technology.
- ◇ The rated insulation voltage of 800V is suitable for infrequent switching and infrequent motor starting in circuits with AC 50Hz (60Hz) rated working voltage 690V and below (DC 250V and below) rated working current 10A to 1600A.
- ◇ The circuit breaker is equipped with overload, short circuit and undervoltage protection devices to protect lines and power equipment from damage.
- ◇ Comply with IEC60947-2 GB/T 14048.2

Model meaning

ZQ M 1 - 125 L ZA / 3 300 2 B 125A

- Operating current (optional)
- Optional codes for four-pole products (A, B, C, D)
- Optional code for different purposes (2, "or no code")
- Code of internal attachment of tripping mode
- Number optional code (2, 3, 4)
- External accessory code (P: electric operation, ZA round handle operation, ZF square handle manual operation)
- Breaking capacity (L, M, H)
- Shell frame grade (63, 125, 250, 400, 630, 800, 1250, 1600)
- Design serial number
- Product model
- Name of the company

Note

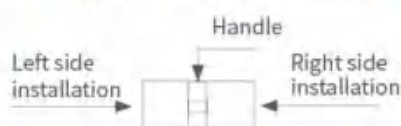
- ◇ Divide according to the shell frame level: Inm=63, Inm=125, Inm=250, Inm=400, Inm=630, Inm=800, Inm=1250, Inm=1600;
- ◇ According to the rated breaking capacity: L standard type (35kA), M high breaking type (65kA) and H high breaking type (125kA);
- ◇ According to the operation mode: there is no code for direct operation of the handle; P means electric operation; Z means rotary handle operation;
- ◇ Optional rated current:
ZQM1-63 is 10, 16, 20, 25, 32, 40, 50, 63;
ZQM1-125 is 16, 20, 25, 32, 40, 50, 63, 80, 100, 125;
ZQM1-250 is 100, 125, 140, 160, 180, 200, 225, 250;
ZQM1-400 is 225, 250, 315, 350, 400;
ZQM1-630 is 400, 500, 630;
ZQM1-800 is 630, 700, 800;
ZQM1-1250 is 800, 1000, 1250;
ZQM1-1600 is 1000, 1250, 1400, 1600.
- ◇ Optional code according to the number of poles: one pole, two poles, three poles and four poles.
- ◇ Optional code of tripping mode and internal accessories: the first digit indicates the tripping mode; The last two digits indicate the internal accessory code, 2 indicates electromagnetic tripping (instantaneous), and 3 indicates multiple tripping (thermal+electromagnetic);
- ◇ Optional codes for different purposes: no code for power distribution, 2 for motor protection.
- ◇ Optional code of quadrupole products
Type A: the N- pole is not equipped with overcurrent tripping element, and N-pole is always connected, and it is not closed or opened with other three poles;
Type b: N-pole is not equipped with overcurrent tripping element, and N-pole is closed and opened together with other three poles;
Type c: N-pole is installed with overcurrent tripping element, and N-pole is closed and opened together with other three poles;
Type d: N-pole is installed with overcurrent tripping element and N- pole is always connected not closed and opened together other three poles.
- ◇ According to the wiring mode, it can be divided into front panel wiring, rear panel wiring, plug-in rear panel wiring and plug-in front panel wiring.
- ◇ Other accessories are mechanical interlocking (mechanical interlocking between two circuit breakers).

ZQM1 Molded case circuit breaker

Applicable working environment and installation conditions

- ◇ The altitude of the installation site is 2000m and below;
- ◇ The temperature of surrounding medium shall not be higher than +40°C and not lower than -5°C; and the 24-hour average value shall not exceed 35°C (except for special orders);
- ◇ The relative humidity of the air at the installation place shall not exceed 50% when the maximum temperature is +40°C; There can be a higher relative humidity at a lower temperature. The average maximum temperature of the wettest month shall not exceed +25°C, and the average maximum relative humidity of the month shall not exceed 90%. The condensation on the product surface caused due to temperature change shall be considered.
- ◇ The pollution level is 3;
- ◇ Protection grade: IP20;
- ◇ The installation category of the main circuit of the circuit breaker is III, and the install category of the auxiliary circuit and control circuit not connected to the main circuit is II;
- ◇ In the place where there is no explosion medium and there is no gas and conductive dust that can corrode metal and damage insulation;
- ◇ In the place free from rain and snow;
- ◇ The circuit breaker shall be installed according to the product instruction.

Release mode and accessory code



- Right side installation
- Shunt release
- Lead direction

- Auxiliary contact
- Undervoltage release
- △ Phase loss protection release

Code name	Accessory name	Model		ZQM1-63, 125		ZQM1-160, 250		ZQM1-400, 630		ZQM1-630, 800		ZQM1-1250, 1600	
		Number of poles		3	4	3	4	3	4	3	4	3	4
208, 308	Alarm contact			← □ □ □	← □ □ □	← □ □ □	← □ □ □	← □ □ □	← □ □ □	← □ □ □	← □ □ □	← □ □ □	← □ □ □
210, 310	Shunt release			← ● □ □	← ● □ □	← ● □ □	← ● □ □	← ● □ □	← ● □ □	← ● □ □	← ● □ □	← ● □ □	← ● □ □
220, 320	Auxiliary contact			← ■ □ □	← ■ □ □	← ■ □ □	← ■ □ □	← ■ □ □	← ■ □ □	← ■ □ □	← ■ □ □	← ■ □ □	← ■ □ □
230, 330	Undervoltage release			← □ □ □	← □ □ □	← □ □ □	← □ □ □	← □ □ □	← □ □ □	← □ □ □	← □ □ □	← □ □ □	← □ □ □
240, 340	Shunt release auxiliary contact			← ● ■ □	← ● ■ □	← ● ■ □	← ● ■ □	← ● ■ □	← ● ■ □	← ● ■ □	← ● ■ □	← ● ■ □	← ● ■ □
250, 350	Shunt release Undervoltage release			← ● □ □	← ● □ □	← ● □ □	← ● □ □	← ● □ □	← ● □ □	← ● □ □	← ● □ □	← ● □ □	← ● □ □
260, 360	Two sets of auxiliary contacts			← ■ □ □	← ■ □ □	← ■ □ □	← ■ □ □	← ■ □ □	← ■ □ □	← ■ □ □	← ■ □ □	← ■ □ □	← ■ □ □
270, 370	Auxiliary contact Undervoltage release			← ■ □ □	← ■ □ □	← ■ □ □	← ■ □ □	← ■ □ □	← ■ □ □	← ■ □ □	← ■ □ □	← ■ □ □	← ■ □ □
218, 318	Shunt release Alarm contact			← ● □ ■	← ● □ ■	← ● □ ■	← ● □ ■	← ● □ ■	← ● □ ■	← ● □ ■	← ● □ ■	← ● □ ■	← ● □ ■
228, 328	Auxiliary contact Alarm contact			← ■ □ □	← ■ □ □	← ■ □ □	← ■ □ □	← ■ □ □	← ■ □ □	← ■ □ □	← ■ □ □	← ■ □ □	← ■ □ □
238, 338	Undervoltage release Alarm contact			← □ □ □	← □ □ □	← □ □ □	← □ □ □	← □ □ □	← □ □ □	← □ □ □	← □ □ □	← □ □ □	← □ □ □
248, 348	Shunt release Auxiliary contact, alarm contact			← ● ■ □	← ● ■ □	← ● ■ □	← ● ■ □	← ● ■ □	← ● ■ □	← ● ■ □	← ● ■ □	← ● ■ □	← ● ■ □
268, 368	Two sets of auxiliary contacts, Alarm contact			← ■ □ □	← ■ □ □	← ■ □ □	← ■ □ □	← ■ □ □	← ■ □ □	← ■ □ □	← ■ □ □	← ■ □ □	← ■ □ □
278, 378	Auxiliary contact, alarm contact of undervoltage release			← ■ □ □	← ■ □ □	← ■ □ □	← ■ □ □	← ■ □ □	← ■ □ □	← ■ □ □	← ■ □ □	← ■ □ □	← ■ □ □
380, 480	Phase loss protection release			← ● □ △	← ● □ △	← ● □ △	← ● □ △	← ● □ △	← ● □ △	← ● □ △	← ● □ △	← ● □ △	← ● □ △

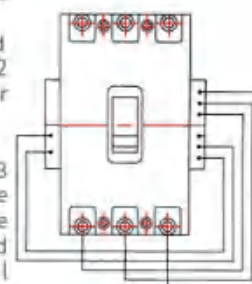
ZQM1 Molded case circuit breaker

Note:

- ◇ 200: circuit breaker body with only electromagnetic release;
- ◇ 300: circuit breaker body with thermal-electromagnetic release;
- ◇ 000: circuit breaker body without tripping release;
- ◇ For ZQM1-125 and 250 bipolar products, there are only 210, 310, 220, 320, 230, and 330;
- ◇ For ZQM1-63 and 125 level ZQM1-250 four-pole circuit breakers, there is no 240, 340, 260, 360, 218, 318, 248, 348, 268 and 368 when the N pole is Type A and D;
- ◇ For ZQM1-400, ZQM1-630 and ZQM1-800, 1250 and 1600, the auxiliary contacts in 248, 348, 278 and 378 specifications are one pair of contacts (i.e. one normally open and one normally closed), and the auxiliary contacts in the 268 and 368 are three pairs of contacts;
- ◇ 630H, 800H(M) auxiliary alarm and alarm test run;
- ◇ There are only five types of shell frames of ZQM1-63, 125, 250, 400 and 630, for the phase loss protection release, which must be used together with the shunt release

Wiring instructions of phase failure protection release:

1. u1 and u2 are connected to uc1 and uc2 respectively for power supply;
2. The sample-limiting power L1, L2 and L3 of the phase failure protection module are respectively connected to the load terminal phase 2, 4 and 6 of the product.



Protection characteristics

- ◇ Thermal release of circuit breaker has inverse time characteristic;
- ◇ The electromagnetic release is instantaneous action, and its characteristic (for power distribution)

Rated current of release (A)	The thermal release (ambient temperature: land +40 °C, marine +45 °C) is 1.05I _n		Action current (A) of electromagnetic release
	1.05I _n (cold) inactivity time (h)	1.30I _n (hot) action time	
I _n ≤ 63	≥ 1	< 1	10I _n ± 20%
63 < I _n ≤ 125	≥ 2	< 2	
125 < I _n ≤ 800	≥ 2	< 2	5I _n ± 20%, 10I _n ± 20%
1250, 1600	≥ 2	< 2	4I _n ± 20%, 7I _n ± 20%

- ◇ The electromagnetic release is instantaneous action with characteristics (for motor protection)

Rated current of release (A)	Thermal release (ambient temperature land +40 °C and marine +45 °C)				Action current (A) of electromagnetic release
	1.0I _n (cold) inactivity time (h)	1.20I _n (hot) action time (h)	1.50I _n (hot) action time (h)	7.2I _n (hot) action time (h)	
10 ≤ I _n ≤ 225	≥ 2	< 2	4min	2s < T _p ≤ 10s	12I _n ± 20%
225 < I _n ≤ 1600			8min	4s < T _p ≤ 20s	

Main technical performance indicators

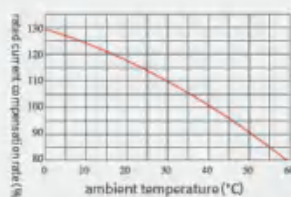
Model	Rated current (A)	Number of poles	Rated isolation voltage (V)	Rated working voltage (V)	Flashover distance (mm)	Rated ultimate short-circuit breaking capacity I _{cu} (kA)	Rated operating short circuit breaking capacity I _{cs} (kA)	Operating performance (times)	
								Power on	Power off
ZQM1-63L	10, 16, 20, 25	2, 3poles	800	660 and below	0(≤50)	25	18	2000	10000
ZQM1-63M	32, 40, 50, 63	3, 4poles			0(≤50)	50	35		
ZQM1-125L	16, 20, 25, 32, 40 50, 63, 80, 100, 125	1, 2, 3, 4 poles			0(≤50)	35	25		
ZQM1-125M					0(≤50)	50	35		
ZQM1-125H					0(≤50)	85	50		
ZQM1-250L					≤50	35	25	2000	10000
ZQM1-250M	100, 125, 140, 160 180, 200, 225, 250	1, 2, 3, 4 poles			≤50	50	35		
ZQM1-250H	≤50				85	50			
ZQM1-400L	≤100				50	35			
ZQM1-400M	225, 250, 315 350, 400				1, 3, 4 poles	≤100	65	42	1000
ZQM1-400H		≤100				85	50		
ZQM1-630L		≤100				50	35		
ZQM1-630M	400, 500, 630	3, 4 poles			≤100	65	42		
ZQM1-630H					≤100	100	65		
ZQM1-800M					≤100	75	50		
ZQM1-800H	630, 700, 800	3, 4 poles			≤100	100	65		
ZQM1-1250H	800, 1000, 1250	3, 4 poles			≤120	65	32.5	1000	2000
ZQM1-1600H	1000, 1250, 1400, 1600	3, 4 poles			≤120	100	65	1000	2000



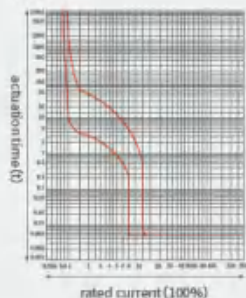
ZQM1
Molded case circuit breaker

Characteristic curve

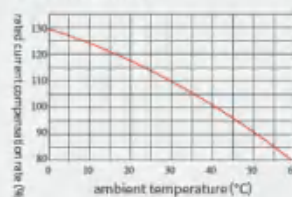
◇ ZQM1-63 and ZQM1-125:
current-temperature characteristic



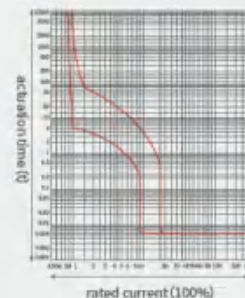
◇ ZQM1-63:
time/current characteristic curve



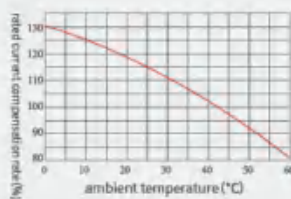
◇ ZQM1-63 and ZQM1-125:
current-temperature characteristic



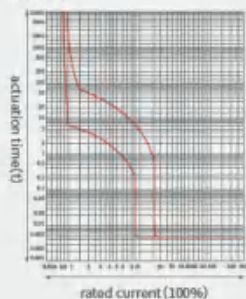
◇ ZQM1-125:
time/current characteristic curve



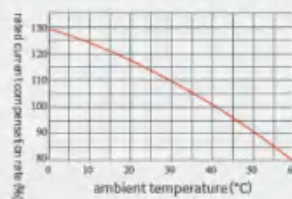
◇ ZQM1-250:
current-temperature characteristic



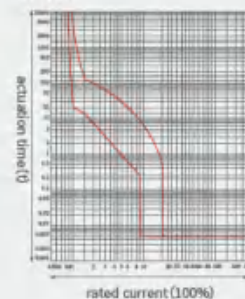
◇ ZQM1-250:
time/current characteristic curve



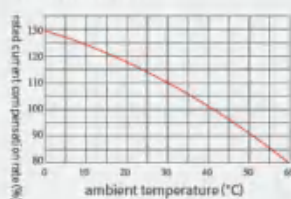
◇ ZQM1-400, ZQM1-630:
current-temperature characteristic



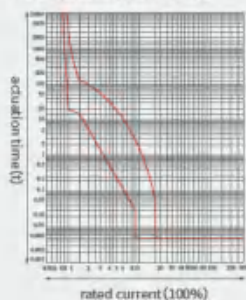
◇ ZQM1-400:
time/current characteristic curve



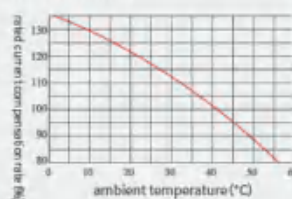
◇ ZQM1-400 and ZQM1-630:
current-temperature characteristic



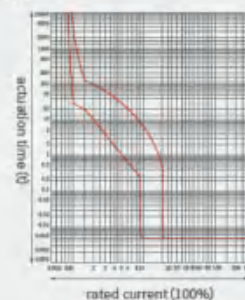
◇ ZQM1-630:
time/current characteristic curve



◇ ZQM1-800 and ZQM1-1600:
current-temperature characteristic



◇ ZQM1-800 and ZQM1-1600:
time/current characteristic curve



ZQM1
Molded case circuit breaker

Outline dimension table

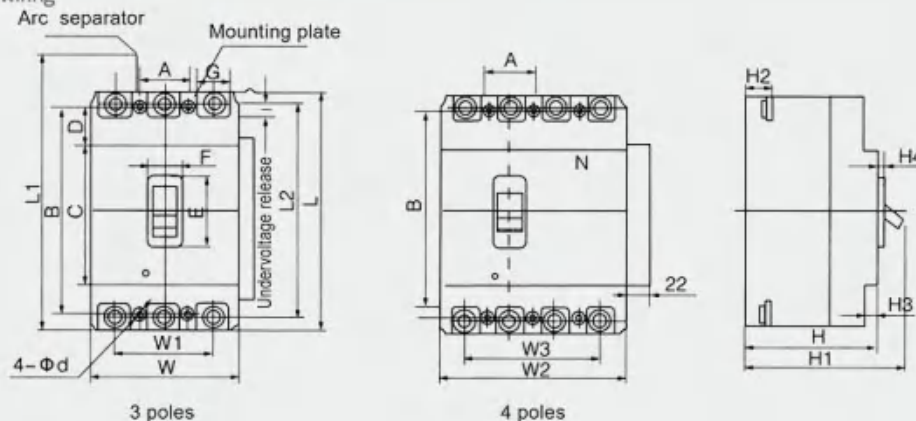
Model	ZQM1													
Product specification and model		Code	63L	63M	125L	125M/H	250L	250M/H	400C/L/M	400H	630L7M	630H	800M	800H
Specification	Unit	W	76	76	91	91	106	106	148	148	180	180	210	210
Front wiring boundary dimension	mm	W1	50	50	60	60	70	70	96	96	116	116	140	140
	mm	L	135	135	150	150	165	165	257	257	270	270	274	280
	mm	L1	154	154	199	199	230	230	356	356	370	370	385	480
	mm	L2	117	117	132	132	144	144	225	225	234	235	242.5	243
	mm	H	74	85	68	85	89	105	107	107	112	112	107	116
	mm	H1	89	98.5	87	102.5	109	126	151	151	156	156	149	152
	mm	H2	18	27.5	24	24	24	24	37	38	45	45	43	45
	mm	H3	14	14	18	18	13	13	42	42	36	36	12.5	8
	mm	H4	4	4	4	4	4	4	7	7	7	7	4.5	4.5
	mm	C	85	85	88	88	102	102	128	174	134	184	154	204
	mm	D	16.5	16.5	23.5	23.5	21.5	21.5	33	25	33	25	19	19
	mm	E	48	48	58	58	58	50	89	89	89	89	106	82
	mm	F	22	22	22.5	22.5	25	22	65	65	65	65	66	66
	mm	G	14	14	17	17	23	23	32	32	44	44	44	45
	mm	I	7.5	7.5	8	8	9	9	14.5	12.5	15	14	11	14
	mm	W2	103	103	121	121	141	141	197	197	240	240	280	280
	mm	W3	75	75	90	90	105	105	144	144	173.5	174	210	210
	mm	L3	117	117	132	132	144	144	225	225	234	235	243	243
Rear wiring boundary dimension	mm	L4	117	117	129	129	126	126	194	194	201	201	243	243
	mm	H5	25	25	68	68	76	73	66	66	68	68	87	87
	mm	H6	49.5	49.5	102	102	110	110	102	102	124	124	87	87
	mm	ΦD	6.5	6.5	24	24	24	24	32	32	48	48	48	48
	mm	M	M6	M6	M8	M8	M10	M10	M12	M12	M16	M16	M16	M16
	mm	L5	125	125	92	92	94	94	170	170	170	170	176.5	176.5
Plug-in boundary dimensions	mm	L6	135	135	168	168	185	185	279	279	299	299	302	302
	mm	H7	27.5	27.5	50	50	50	50	60	60	60	60	88	88
	mm	H8	36	36	65	65	68.5	68.5	84	84	92	92	88	88
	mm	H9	43	43	77	77	86.5	86.5	105.5	105.5	112	112	104	104
	mm	H10	8	8	14	14	14	14	18.5	18.5	20	20	20	20
	mm	J	60	60	56	56	54	54	129	129	123	123	142	142
	mm	K	50.5	50.5	60	60	70	70	60	60	125	125	90	90
	mm	Φd1	5.5	5.5	6.5	6.5	6.5	6.5	8.5	8.5	8.5	8.5	10	10
	mm	M1	M5	M5	M8	M8	M8	M8	M12	M12	M12	M12	M12	M12
Installation dimension	mm	A	25	25	30	30	35	35	44	44	58	58	70	70
	mm	B	117	117	129	129	126	126	194	194	201	201	243	243
	mm	Φd	3.5	3.5	4.5	4.5	5	5	7	7	7	7	7	7



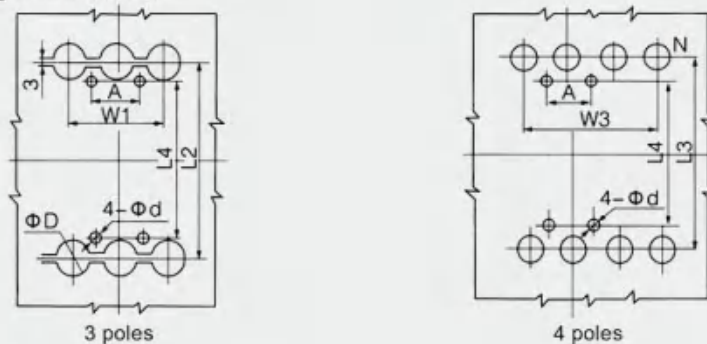
ZQM1
Molded case circuit breaker

ZQM1-63 ~ 800 outline and installation dimensions

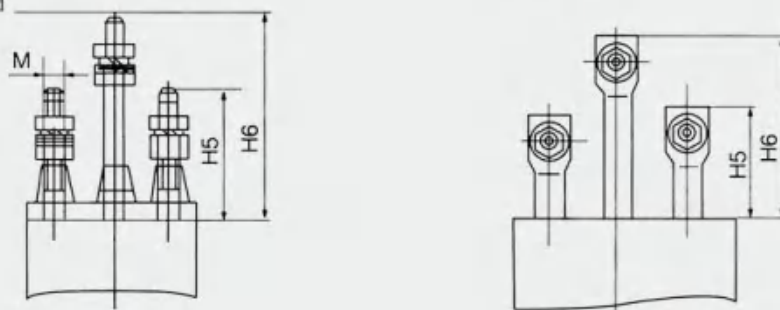
◇ Front plate wiring



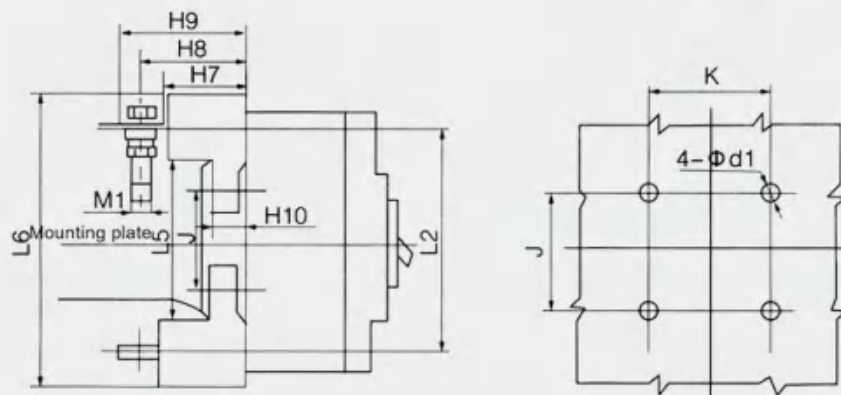
◇ Hole drawing for wiring behind the board

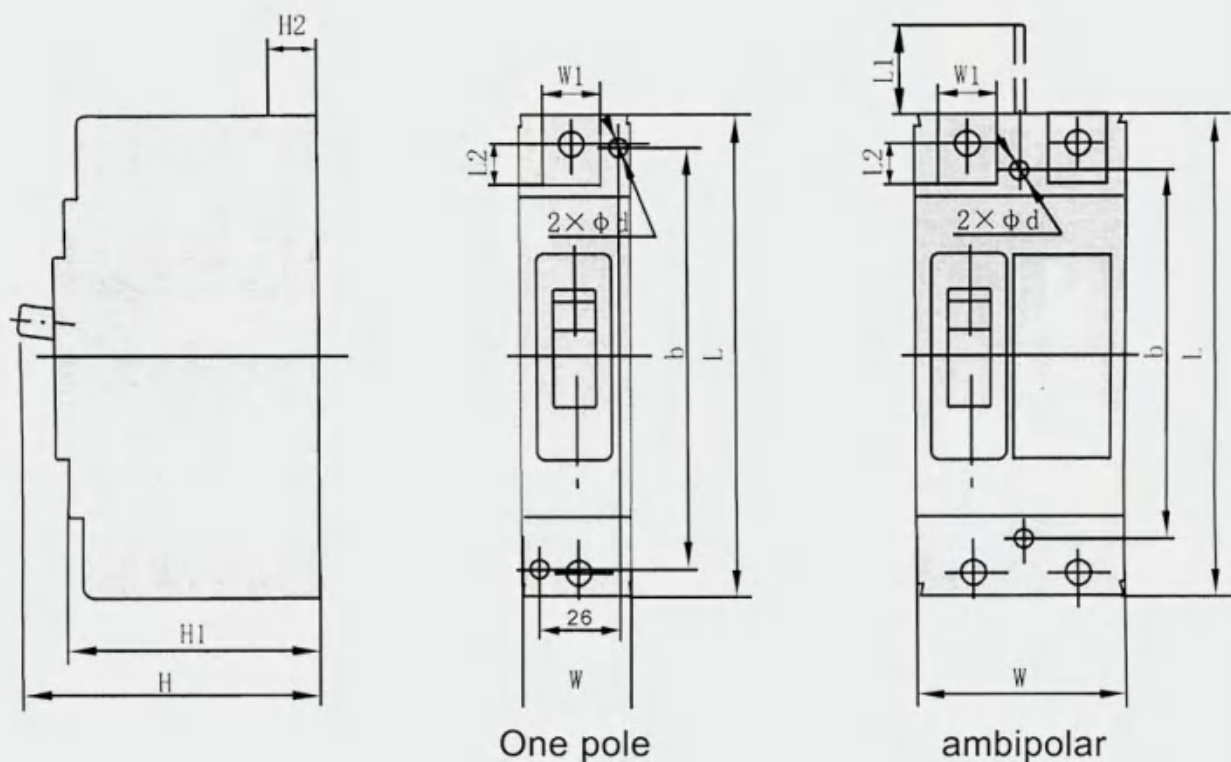


◇ Wiring behind the board



◇ Plug-in



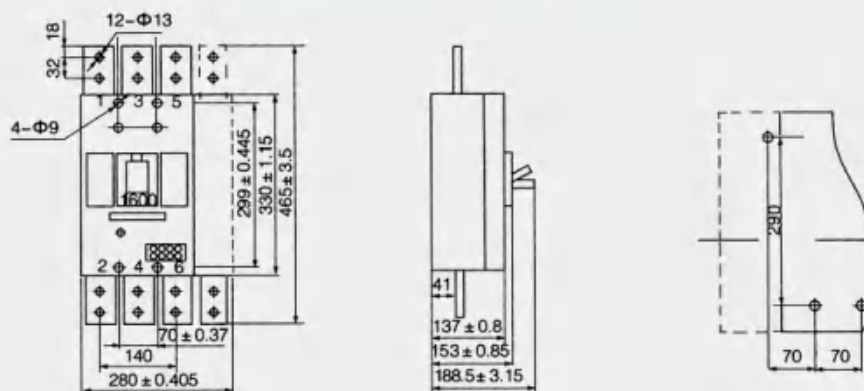
**ZQM1**
Molded case circuit breaker**ZM1-125/250/1p/2p-400/1p fixed plate front boundary dimensions and installation dimensions**

Model	Digital pole	Boundary dimensions								Installation dimensions	
		L	L1	L2	W	W1	H*	H1*	H2*	b	d
ZQM1-125	1	150	-	7	39	17.5	103.5	87	24	129	4.5
	2	150	51	7	65	17.5	103.5	87	24	129	4.5
ZQM1-250	1	165	-	9	43	23	124.5	104	24.5	126	5.5
	2	165	64	9	74	23	124.5	104	24.5	126	5.5
ZQM1-400	1	257	-	14.5	80	32	151	107	37	194	7

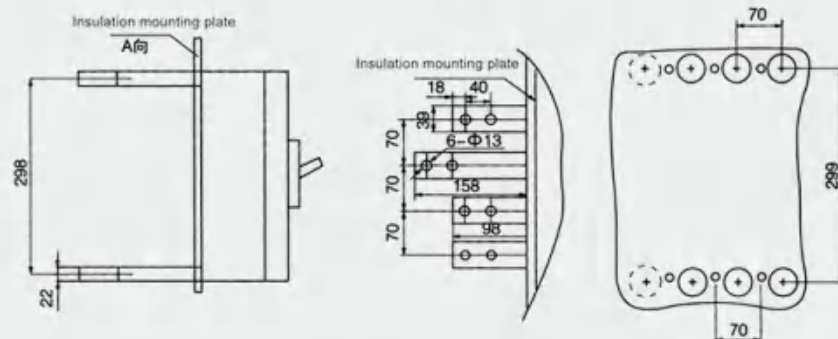
ZQM1 Molded case circuit breaker

QM1-1250 ~ 1600 appearance and installation dimensions

◇ Front wiring

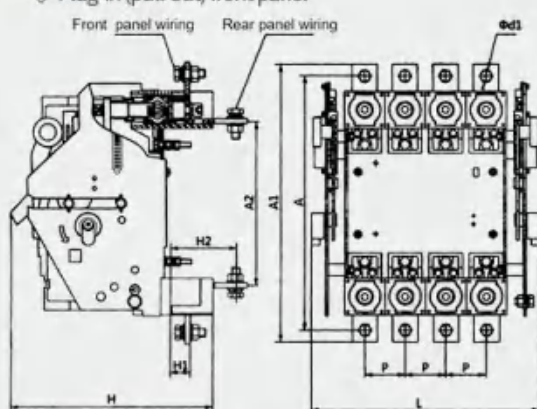


◇ Rear wiring

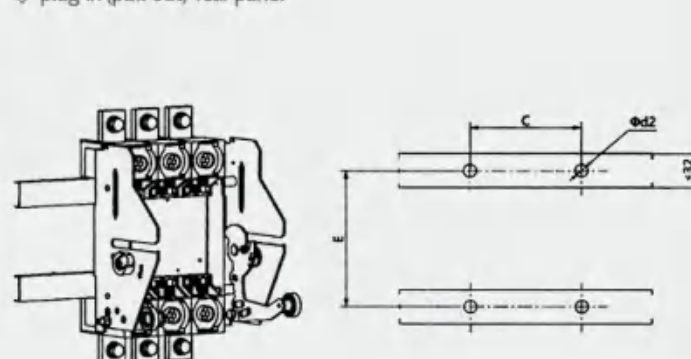


QM1-1250 ~ 1600 Plug-in (pull-out) front and back panels

◇ Plug-in (pull-out) front panel



◇ plug-in (pull-out) rear panel



Pull-out front/rear plate

Model	A	A1	A2	H	H1	H2	P	L	C	E	Φd1	Φd2
ZQM1-1250/3P	485	515	261	280	29	48	70	265	140	140	Φ13.5	Φ9
ZQM1-1600/3P												

ZQM1 Molded case circuit breaker

Lineup coefficient

Attachment name	Envirmental temperature	+40°C (marine +45°C)	+45°C (marine +50°C)	+50°C (marine+55°C)	+55°C (marine +60°C)	+60°C (marine+65°C)
	Coefficient	Lineup coefficient	Lineup coefficient	Lineup coefficient	Lineup coefficient	Lineup coefficient
ZQM1-63(L/M)		1In	0.94In	0.88In	0.80In	0.72In
ZQM1-125(L/M/H)		1In	0.95In	0.89In	0.84In	0.76In
ZQM1-250(L/M/H)		1In	0.96In	0.91In	0.87In	0.82In
ZQM1-400(L/M/H)		1In	0.94In	0.87In	0.81In	0.73In
ZQM1-630(L/M/H)		1In	0.93In	0.88In	0.83In	0.76In
ZQM1-800(M/H)		1In	0.88In	0.83In	0.79In	0.76In
ZQM1-1250H		1In	0.89In	0.85In	0.77In	0.7In
ZQM1-1600H		1In	0.87In	0.80In	0.74In	0.69In

Note: The above lineup coefficients are measured under the rated frame current .

Internal accessories

Internal accessories

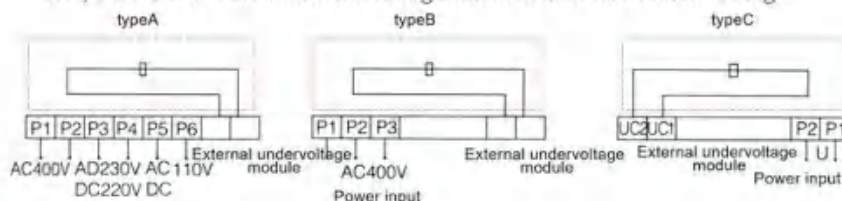
The internal accessories of the circuit breaker can directly lead out wiring according to the user's needs, the circuit breaker accessories can be directly wired out, or add a lead out terminal block.

Type A: one specification with five voltage levels: AC 50hz 110v 230v 400v; DC 110V 220V ;

Type B: (three-phase protection) one specification: AC50Hz 400V;

Type C: two specifications: AC50Hz AC230V or 400V.

The wiring diagram (the inner accessories of the switch are shown in the dotted box) ask the users to confirm the voltage and then make the normal wiring.



Undervoltage shunt release power

Under 35%~70% of the rated working voltage, the under voltage release shall reliably trip the circuit breaker;

When the rated working voltage is 85%~110%, the under voltage release shall ensure that the circuit breaker can be closed;

When the rated working voltage is lower than 35%, the undervoltage release shall prevent the circuit breaker from closing.

Warning: The undervoltage release must be powered on before the circuit breaker can be tripped and closed again. Otherwise, the switch will be damaged!

Note: The specifications in the red box above are under trial operation.



Equipped with circuit breaker	Undervoltage release power (w)	
	AC230V	AC400V
ZQM1-63	3.5	3.3
ZQM1-125	2.6	3.3
ZQM1-250	3.8	3.3
ZQM1-400	3.7	2.7
ZQM1-630	2.3	2.7
ZQM1-800	2.5	2.8
ZQM1-1250 1600	3.0	3.3

ZQM1 Molded case circuit breaker

Internal accessories

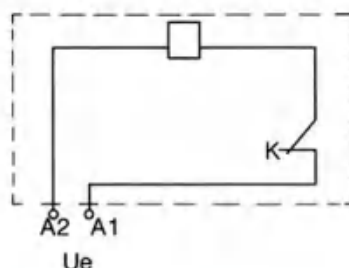


◇ Shunt release

Line diagram (the internal accessories of the switch are in the dotted frame)

Specifications: AC 50Hz, 230V or 400V; 220V DC

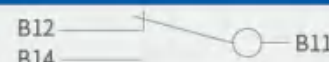
When DC 220V is between 70-110% of the rated control power supply voltage, the shunt release shall reliably trip the circuit breaker.



K: The microswitch in series with the coil inside the shunt release is normally closed. When the circuit breaker is opened, the contact will automatically open and close when it is closed.

◇ Alarm contact

B11 and B12 are normally closed in the "opening and closing" state.



B11 and B14 are normally closed under "free tripping" status



◇ Alarm contact

The circuit breaker is in the "off" position		Circuit breaker with frame level current of 400A and above (one group is four pairs of contacts)
		Circuit breakers with shell level current of 225A and below (one group is two pairs of contacts)
The circuit breaker is in the "on" position		Circuit breaker with frame level current of 400A and above (one group is four pairs of contacts)
		Circuit breakers with frame level current of 225A and below (one group is two pairs of contacts)

◇ Rated current of auxiliary contact

Rated current of shell frame	Agreed heating current (Ith)	rated working current at AC400V (Ie)
≥ 400A	6	1
≤ 225A	3	0.3

Use category	Put through			Breaking			Frequency	Operating frequency/hour	Power on time (s)
	I/Ie	U/Ue	COSΦ	I/Ie	U/Ue	COSΦ			
AC-15	10	1	0.3	1	1	0.3	6050	360	≥ 0.05

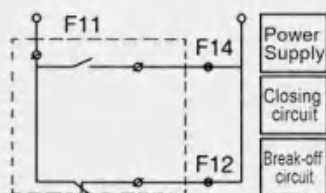
Use category	Put through			Breaking			Frequency	Operating frequency/hour	Power on time (s)
	I/Ie	U/Ue	COSΦ	I/Ie	U/Ue	COSΦ			
DC-13	10	1.1	0.3	10	1.1	0.3	10	120	≥ 0.05



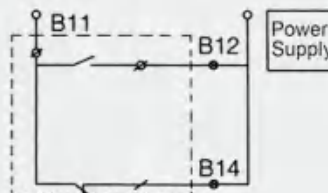
ZQM1 Molded case circuit breaker

Internal attachment

◇ Wiring diagram of auxiliary contacts (internal accessories of switch in virtual frame)



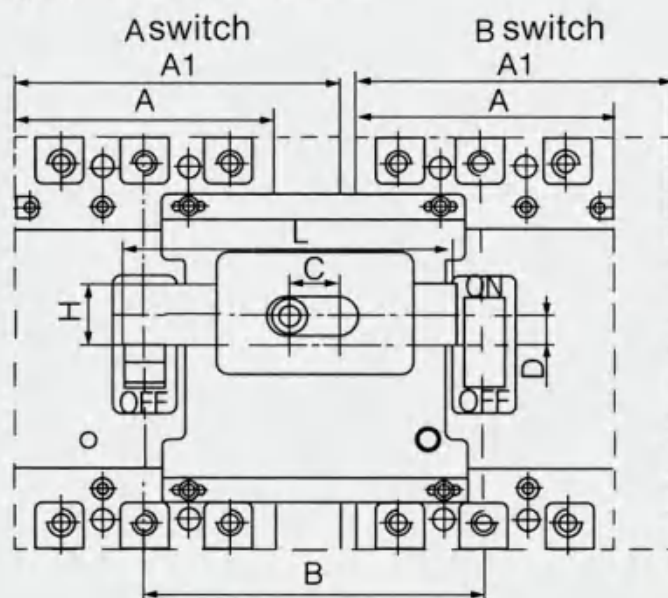
◇ Alarm wiring diagram (the virtual box is the internal accessory of the switch)



When the circuit breaker is normally closed, the alarm contact does not act. Only after free tripping (or fault tripping), the alarm will be given, and the contact will change its original position, that is, normally open to normally closed, normally closed to normally open, B12 lights up and B14 lights out. After the circuit breaker is buckled again, the alarm contact will return to the original state.

◇ External accessories of circuit breaker

Mechanical interlocking mechanism of two circuit breakers



Product name	A	A1	B	C	D	L	H	Remarks
ZQM1-63	78		102	18	13	95	22	Used for ZQM1-63L M
ZQM1-125	92		120	18	11.5	118	22	Used for ZQM1-125L M H
ZQM1-250	107		135	18	9	130	22	Used for ZQM1-250L M H
ZQM1-400	150		190	42	16	175	22	Used for ZQM1-400L M
ZQM1-630	182		220	42	12	198	22	Used for ZQM1-630L M and 400H
ZQM1-800	210		240	42	3.5	230	22	Used for ZQM1-630H and 800M H
ZQM1-63/4P		103	132	18	13	125	22	Used for ZQM1-63 quadrupole
ZQM1-125/4P		122	152	18	11.5	150	22	Used for ZQM1-125 quadrupole
ZQM1-250/4P		142	173	18	9	168	22	Used for ZQM1-250 quadrupole
ZQM1-400/4P		198	240	42	16	225	22	Used for ZQM1-400M quadrupole
ZQM1-630/4P		240	280	42	12	258	22	Used for ZQM1-630 quadrupole

ZQM1 Molded case circuit breaker

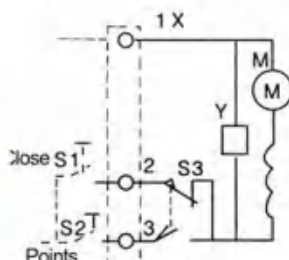
Internal attachment

◇ Electric mechanism operation



ZQM1-63/125/160/250

Schematic Diagram of Opening and Closing of Electromagnet Operation (the external accessories of the switch are in the dotted frame)

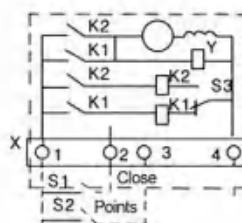


M-Motor Y-Electromagnetic brake
S3-Microswitch X-Terminal board
S1、S2-Ammonium button
(prepared by the user)

Common AC wiring diagram

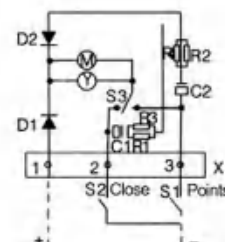
ZQM1-400/630/800/1250/1600

Opening and closing schematic diagram of motor operation (the external accessories of the switch are in the dotted frame)



Y-Electromagnetic brake M-Motor
K1~2-Relay S3-Microswitch
S1~2-Ammonium button
(prepared by the user)
X-Terminal board

AC self-locking wiring diagram



M-Motor R1 R2、R3、R4:Resistance
Y-Electromagnetic brake
C1 C2:Capacitance
D1、D2:Diode S3-Microswitch
X-Terminal board
S1、S2-N-Ammonium button
(prepared by the user)

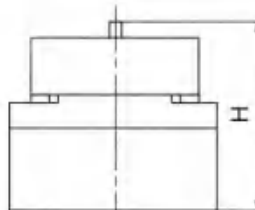
Common DC wiring diagram

◇ Electric mechanism operation

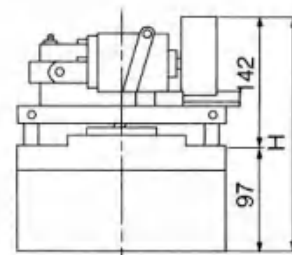
Starting current of matched circuit breaker(A)	Starting power (w)	Life/time	Rated working current at AC400V (Ie)
ZQM1-63(L M)	<5	1100	10000
ZQM1-125(L M H)	<7	1540	10000
ZQM1-250(L M H)	<8.5	1870	8000
ZQM1-400(L、M、H)	<5.7	1200	5000
ZQM1-630(L、M、H)	<5.7	1200	5000
ZQM1-800(M、H)	<7.5	2000	3000
ZQM1-1250	<8.5	2500	3000
ZQM1-1600	<8.5	2500	3000

Note: After the circuit breaker trips, the electric operating mechanism must make the circuit breaker trip again before closing.

◇ Height of electric operating mechanism



63~225



400~1600

◇ Total height of circuit breaker after installing electric operating mechanism

Model	ZQM1-63L	ZQM1-63M	ZQM1-125L	ZQM1-125M、H	ZQM1-250L	ZQM1-250M、H	ZQM1-400L	ZQM1-400M、H	ZQM1-630L、M、H	ZQM1-800M、H	ZQM1-1250 1600
Height	157	166	155	170	178	196	235	236.5	240	230	268

ZQM1 Molded case circuit breaker

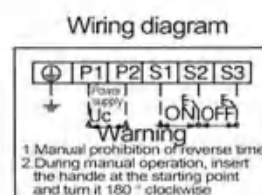
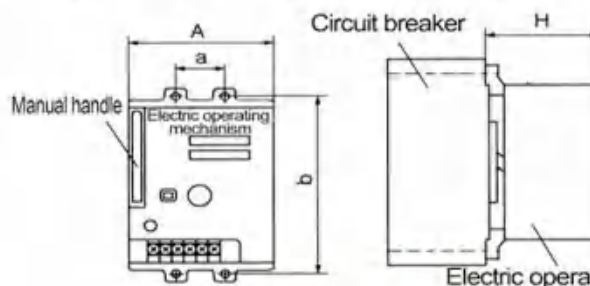
Internal accessories

◇ CD2 electric operating mechanism

Features and applications: CD2 series electric operating mechanism adopts advanced switching power supply technology and is driven by small permanent magnet motor. It can be used for both AC and DC, with small working current, and is suitable for 63-800A molded case circuit breaker.

◇ Outline dimensions and installation diagram of CD2 electric operating mechanism

Operating mechanism model	Overall installation dimension (mm)				Rated voltage (V)	Action current (A)	Mechanism life (times)	Motor power (W)
	a	b	A	H				
CD2-63/ M	25	117	74	90	AC 230/110V DC 250/110V or DC 24V	≤ 0.5	14000	14
CD2-125/ M	30	129	90	92				
CD2-250/ M	35	126	90	93				
CD2-400/ M	44	194	130	143				
CD2-630/ M	58	201	130	143	AC 230/110V DC 250/110V or DC 24V	≤ 2.0	5000	35
CD2-800/ M	70	243	130	147				
CD2-1250/ M	70	300	130	153				
CD2-1600/ M	70	300	130	153				



Operating mechanism characteristics of rotary handle

◇ Features of rotating handle operating mechanism

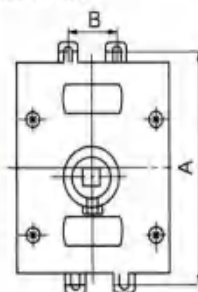
The operating mechanism adopts a unique design and transmission mechanism, and the breaking, closing and retriing of the molded case circuit breaker are realized by rotating the handle. Flexible and stable operation, small operating force, convenient installation, and no need to adjust the overall performance and quality of the mechanism are superior to other similar products. At the same time, the mechanism is provided with a rotary handle. In order to meet the use requirements of different users, our factory can provide CSI series, ZQM1 (CS2) series and CZ series of operating mechanisms for selection (three -pole products and four-pole products are common).

◇ Purpose

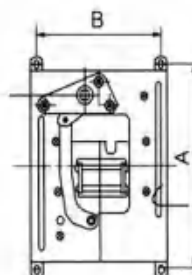
This mechanism is specially used for ZQM1 series molded case circuit breakers to achieve the requirements for drawer cabinets, distribution cabinets, power boxes, etc. to operate on the panel by rotating the handle, and to ensure that the door panel of the cabinet can not be opened when the circuit breaker is closed (i.e. interlocked with the door).

Note: The upper part of the figure is the incoming line end; the operating machinery with square shaft at the center is suitable for vertical and horizontal installation.

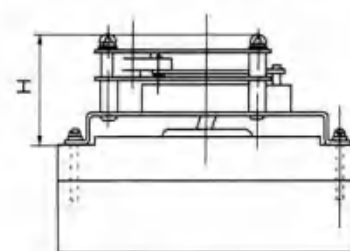
◇ Refer to the following figure for the relative dimensions and installation dimensions of the operating mechanical model operating lever and the center of the circuit breaker:



ZQM1-63 Operating mechanism



ZQM1-125、250、400、630、800 Operating mechanism



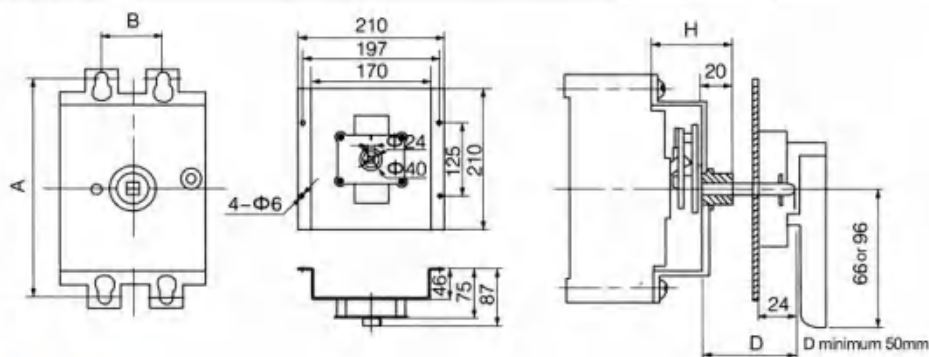
Operating mechanism height

ZQM1 Molded case circuit breaker

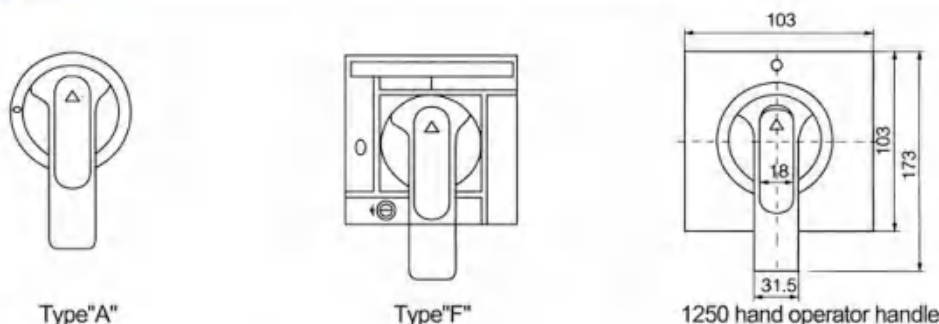
Rotating handle operating mechanism

- ◇ The operating mechanism is also equipped with CS1 series (divided into metal type and plastic type structures) for users to use the shape and size first.

Operating mechanism model	A	B	H
ZQM1-63(CZ3-138)	102	25	50
ZQM1-125A(CS2-125/M)	104	30	45
ZQM1-250A(CS2-250/M)	142	35	47
ZQM1-400A(CS2-400/ML)	194	138	88
ZQM1-630A(CS2-630/M)	200	168	98
ZQM1-800A(CS1-800/M)	245	198	87
ZQM1-1600A(CS1-1250/1600)	125	197	87

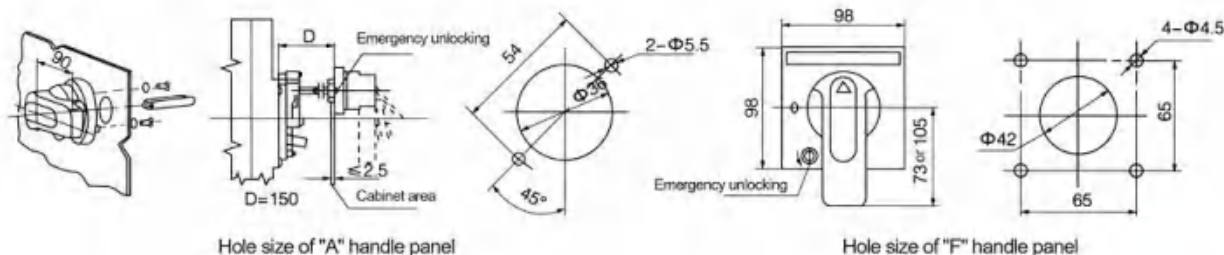


Handle diagram



- ◇ For the same mechanism of CS1 series and ZQM1 (CS2) series, two kinds of handles can be selected for operation: one square handle is called "F" handle, and the other round handle is called "A" handle for short. (As shown in the figure) "A" handle features;
- ◇ Simple structure and convenient installation. It also has the function of consistent opening of panels with different specifications of corresponding circuit breakers. "F" handle features;
- ◇ When the circuit breaker is equipped with undervoltage release and in the tripping position, the cabinet door can be closed and the cabinet door can be opened by emergency unlocking. The corresponding circuit breakers have different specifications, and the opening of the door panel is consistent.

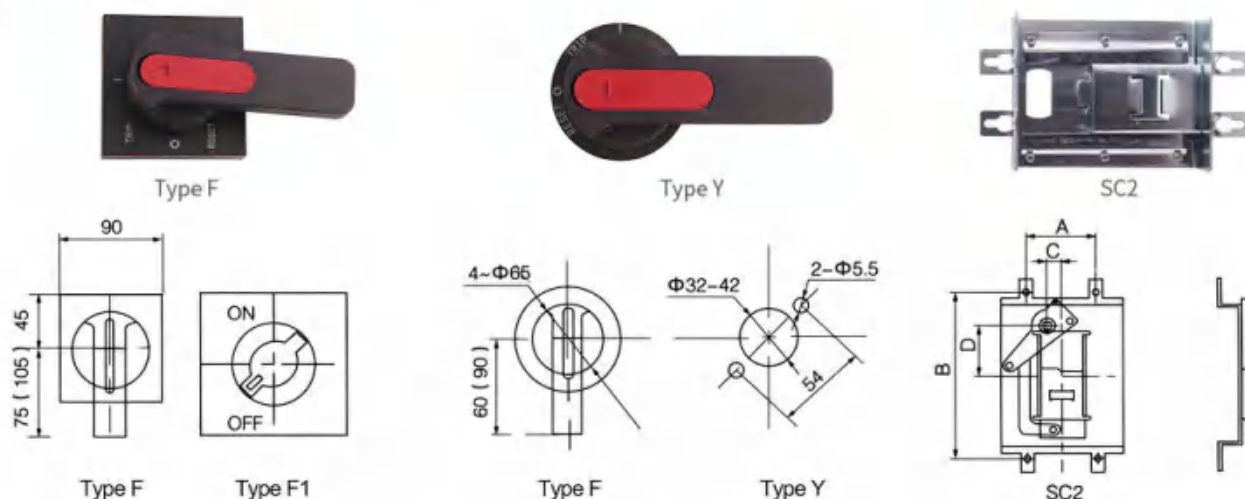
Note: The special specification of square shaft length shall be noted when ordering, and the long charge D=150 is generally provided.



ZQM1 Molded case circuit breaker

Handle diagram

◇ The operating mechanism is additionally equipped with SC2 eccentric operating mechanism series for users to select the shape and size



◇ Equipped with ZQM1 series SC2 eccentric operating mechanism

Manual operation model	Installation dimensions			
	A	B	C	D
SC2(Y F)-63M	25	100	0	35
SC2(Y F)-125M	30	104	11	35
SC2(Y F)-250M	35	144	11	35
SC2(Y F)-400M	138	195	15	60
SC2(Y F)-630M	172	81	15	60
SC2(Y F)-800M	198	242	15	60

Test current and the section area of conductor

The section area of the connecting conductor for temperature rise test and the corresponding test current

Rated current value A	10	16.20	25	32	40.50	63	80	100	125	140	160	180.200.225	250	315	400
Section area of conductor mm ²	1.5	2.5	4	6	10	16	25	35	50	50	70	95	120	185	240

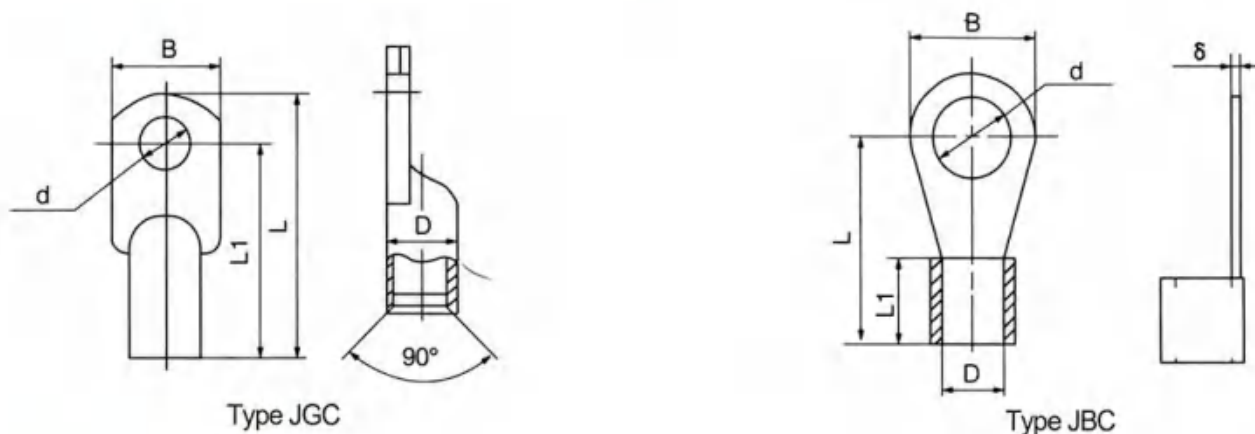
Rated current value A	Cable section area mm ²		Copper bar size	
	Quantity	Section area mm ²	Quantity	Dimension
500	2	150	2	30x5
630	2	185	2	40x5
700.800	2	240	2	50x5
1000			2	60x5
1250			2	80x5
1600			2	100x5



ZQM1

Molded case circuit breaker

Boundary dimension and installation drawing



Terminal model

◇ The terminals blocks are divided into JGC, JBC and JB models for users to choose from.

Model	Current A	Section area of conductor mm ²	Terminal model	B	L	L1	D	d
ZQM1-63	63	16	JGC16-25	12	38	31.5	Φ6	Φ 8.2
ZQM1-125	10.16.20	2.2	JGC2.5-8	15	28	8.5	Φ2.6	Φ 8.2
	32	6	JGC6-8	15	30	10	Φ3.5	Φ 8.2
	40.50	10	JGC10-8	15	32	11	Φ4.5	Φ 8.2
	63	16	JGC16-8	17	41	33.5	Φ6	Φ 8.2
	80	25	JGC25-8	17	46	38.5	Φ7	Φ 8.2
	125	35	JGC35-8	17	52	44.5	Φ8	Φ 8.2
ZQM1-250	125	50	JGC50-8	22	54	45	Φ10	Φ 8.2
	180.200.225	95	JGC95-8	22	66	57	Φ13	Φ 8.2
	250	120	JGC120-8	22	66	57	Φ13	Φ 8.2

Note: JB2.5-5 is adopted for specifications 10, 16 and 20A in ZQM1-63; JB6-5 is adopted for 32A specification; JB10-5 terminal blocks are used for 40A and 50A specifications

Ordering instructions

- ◇ If "F" handle is selected, model CS1 and ZQM1 (CS2) are not marked with "F". Such as CS1-125/M, CS2-125/M, etc;
- ◇ If "A" handle is selected, "A" shall be added to the model. They are CS1A and CS2A. Such as CS1A-250/M, CS2A-250/M, etc.

Warn users:

Manual operating mechanism must be ordered from our company to ensure the quality.

If the user purchases by himself, please select the manufacturer with reliable quality, otherwise the company will not be responsible for any adverse consequences after assembly.

Note: Due to the continuous improvement of product technology, all data should be subject to the latest data confirmed by our company. In case of any change, no further notice will be given.



Striving for perfection is the driving force that we have been insisting on. Grasp every detail to make the product more perfect.



www.cnzq.com.cn

Intelligent universal circuit breaker

Molded case circuit breaker

Intelligent molded case circuit breaker

Leakage molded case circuit breaker

Miniature circuit breaker

Self-resetting overvoltage and undervoltage

dual power switch

Load disconnect

Contactor thermal relay

Branch/busbar

ZQM8X

low-voltage molded case circuit breaker



ZQM8X low-voltage molded case circuit breaker



Characteristic

Rated voltage				
	Rated isolation voltage (V)	Ui		1000
	Rated impulse withstand voltage (kV)	Uimp		8
	Rated working voltage (V)	Ue	AC 50/60Hz	400/690
Applicable to isolation		IEC/EN 60947-2		
Application category	Thermomagnetic type A	Icw:100/160/250 400/630	8kA 1S	
	Electronic B		15kA 1S	
Class of pollution		IEC 60664-1		3
Control				
	Manual	Direct or extended rotary handle remote control by toggle handle		■
	Electric	Remote control		■
Type				
	Stationary type			■
	Drawout type	Plug-in base frame		■

Circuit breaker

Model		ZQM8X-100	ZQM8X-160	ZQM8X-250	ZQM8X-400	ZQM8X-630
Breaking level		N H S	N H S	N H S	N H S	N H S
Electrical performance conforms to IEC 60947-2.						
Rated current (A) In 40°C		100	160	250	400	630
Number of poles		2 ⁽³⁾ , 3, 4	2 ⁽³⁾ , 3, 4	2 ⁽³⁾ , 3, 4	3, 4	3, 4
(kAms)						
Icu	AC 50/60Hz 400V	55 100 150	55 100 150	55 100 150	55 100 150	55 100 150
	690V	25 35 65	25 35 65	25 35 65	35 50 65	35 50 65
Use breaking capacity (kAms)						
Ics	%Icu	100% ⁽⁴⁾	100% ⁽⁴⁾	100% ⁽⁴⁾	100% ⁽⁴⁾	100% ⁽⁴⁾
Life (C-O cycle)	machinery	50000	40000	20000	15000	15000
	Electrical 400V In	30000	20000	10000	7000	7000
	690V In	20000	15000	10000	6000	6000
Protection and measurement						
Short circuit protection	Magnetic protection	■	■	■	■	■
	Hermomagnetism	■	■	■	■	■
	With neutral line protection (Off-0.5-1-OSN) ⁽¹⁾	■	■	■	■	■
	With ground fault protection	■	■	■	■	■
	With Zone Selective Interlocking (ZSI) ⁽²⁾	■	■	■	■	■
Display I, U, P, F, E measurement/fault current measurement		■	■	■	■	■
Iectotype	Cabinet door display unit	■	■	■	■	■
	Operational management counter	■	■	■	■	■
	Historical logs and alarms	■	■	■	■	■
	Measurement communication	■	■	■	■	■
	Switch status/control communication	■	■	■	■	■
	Through Vigi leakage protection module	■	■	■	■	■

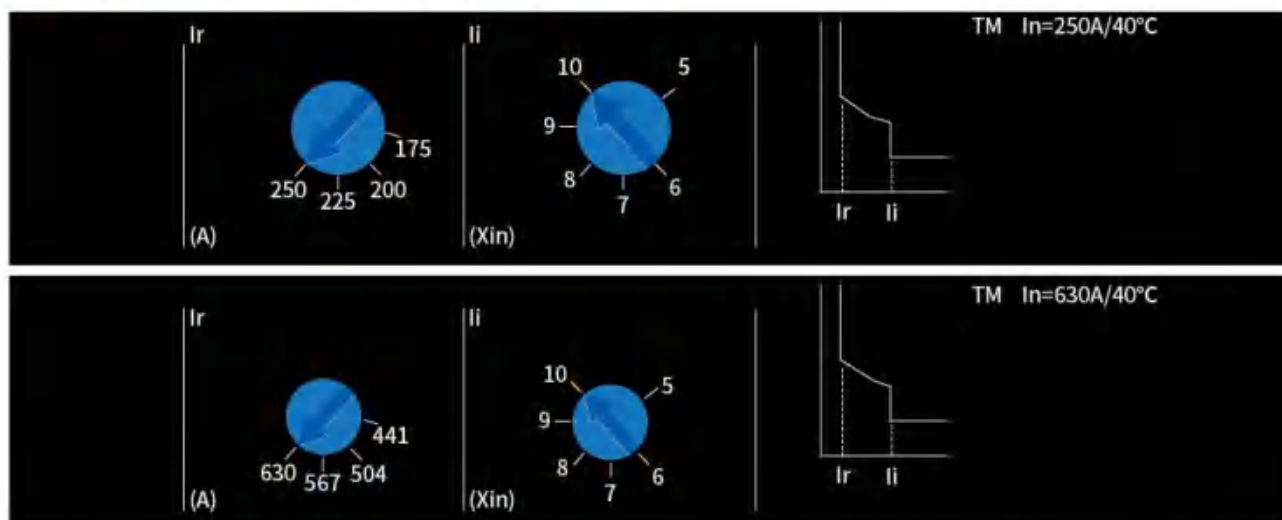
ZQM8X low-voltage molded case circuit breaker

Installation/connection							
Size and weight							
Foot(mm)	Fixed front connection	2/3 ⁽²⁾	105×161×86	105×161×86	105×161×86	140×255×110	140×255×110
W×H×D		4P	140×161×86	140×161×86	140×161×86	185×255×110	185×255×110
Weight(kg)	Fixed front connection	2/3 ⁽³⁾	2.05	2.2	2.4	6.05	6.2
		4P	2.4	2.6	2.8	7.90	8.13
Connect							
Connection terminal	Pole spacing without/with terminal extender		35/45mm	35/45mm	35/45mm	45/45.5mm 45/70mm	45/45.5mm 45/70mm
	mm ²		300	300	300	4×240	4×240

Functions and characteristics

- ◆ TM thermal magnetic tripping unit can be used on ZQM8X-100/160/250/400/630 circuit breaker with breaking level of N/H/S.
- ◆ There are two kinds of TM tripping units:
 - ◇ TM-D — Used to protect distribution cables.
 - ◇ TM-G — With lower threshold value, suitable for protecting generator or long cable
- ◇ Vigi leakage module can cooperate with all circuit breakers to provide leakage protection.

TM-D and TM-G Thermomagnetic Tripping Unit



Circuit breaker equipped with thermal magnetic release unit is mainly used in industrial and commercial electrical distribution field. TM-D is used to protect the cables on the power distribution system powered by the transformer. TM-G is used to protect the generator (compared with the transformer, the short circuit current is lower) and the distribution system with long cables (due to the high impedance of long cables, the fault current is smaller).

Protection

- ◆ Overload protection: thermal protection (Ir)
 - The overload protection function is based on bimetal sheet and provides inverse time curve I²t. If the limit is exceeded, the deformation of the bimetallic sheet can trip the operating mechanism of the circuit breaker.
- ◆ Overload protection has the following characteristics:
 - ◇ Ir adjustment value is in amperes. The adjustable range is 0.7 to 1 time (16A to 250A) of the rated current of the tripping unit. The current setting value of the corresponding series of tripping units is 11 to 250 A.
 - ◇ The time delay is not adjustable.
- ◆ Short circuit protection: magnetic protection (Ii)
 - ◇ The Ii value of short-circuit protection function can be adjusted. Once the short-circuit current exceeds the set value, the circuit breaker will trip instantaneously.
- ◇ TM-D: the rated current is 16 to 160A, and Ii is not adjustable; The rated current is 200 to 630A, and Ii can be adjusted, and the adjustment range is 5 to 10×In.
- ◆ Protection type
 - 3-pole
 - 3p3d: 3-pole shell frame (3p); All 3 poles are protected (3D)
 - 3P2D: 3-pole shell frame (3P); Among them, two poles have protection (2D), that is, three pole shell frame products. Only two poles have breaking units, and one pole is empty.
 - 4-pole
 - 4P3D: 4-pole shell frame (4P); Three poles are protected (3D) (neutral line is not protected).
 - 4P4D: 4-pole shell frame (4P); All 4 poles have protection (phase and neutral have the same protection threshold).

ZQM8X low-voltage molded case circuit breaker

Technical parameters



Thermomagnetic tripping unit		TM16D to 630D																		
Rated current (A)	In40°C ⁽¹⁾	16	25	32	40	50	63	80	100	125	160	200	250	320	350	400	500	550	600	630
circuit breaker	ZQM8X-100	■	■	■	■	■	■	■	■	—	—	—	—	—	—	—	—	—	—	—
	ZQM8X-160	—	—	—	—	—	—	■	■	■	■	—	—	—	—	—	—	—	—	—
	ZQM8X-250	—	—	—	—	—	—	■	■	■	■	■	■	—	—	—	—	—	—	—
	ZQM8X-400	—	—	—	—	—	—	—	—	—	—	—	■	■	■	■	—	—	—	—
	ZQM8X-630	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	■	■	■	■



Overload protection (thermal protection)		
Setting value of tripping current	$I_r = I_n \times \dots$	Adjustable range 0.7 to $1 \times I_n$
Delay (s)	t_r	Not adjustable
	T_r at $2 \times I_r$	120 to 300
Short circuit protection (magnetic protection)		
Short circuit protection current setting value (A)	I_i	Not adjustable
Accuracy $\pm 20\%$	ZQM8X-100/160	$10 I_n \times I_n$
	ZQM8X-250/630	5 至 $10 \times I_n$
Delay	t_r	Not adjustable
Neutral line protection		
Neutral line protection	4P3D	Neutral line protection
Neutral line protection	4P4D	$1 \times I_n$

1) If the temperature is higher than 40°C, the thermal protection characteristics should be corrected. Please refer to the temperature derating table for

Thermomagnetic tripping unit		T _g TM16G to 630G																		
Rated current (A)	In40°C ⁽¹⁾	16	25	32	40	50	63	80	100	125	160	200	250	320	350	400	500	550	600	630
Circuit breaker	ZQM8X-100	■	■	■	■	■	■	■	■	—	—	—	—	—	—	—	—	—	—	—
	ZQM8X-160	—	—	—	—	—	—	■	■	■	■	—	—	—	—	—	—	—	—	—
	ZQM8X-250	—	—	—	—	—	—	■	■	■	■	■	■	—	—	—	—	—	—	—
	ZQM8X-400	—	—	—	—	—	—	—	—	—	—	—	■	■	■	■	—	—	—	—
	ZQM8X-630	—	—	—	—	—	—	—	—	—	—	—	—	—	—	■	■	■	■	■



Overload protection (thermal protection)		
Setting value of tripping current	$I_r = I_n \times \dots$	Adjustable range 0.7 to $1 \times I_n$
Delay (s)	t_r	Not adjustable
	T_r at $2 \times I_r$	120 to 300
	T_r at $6 \times I_r$	—
Short circuit protection (magnetic protection)		
Short circuit protection current setting value (A)	I_i	Not adjustable
Accuracy $\pm 20\%$	ZQM8X-100/160	Not adjustable
Delay	t_r	Not adjustable
Neutral line protection		
Neutral line protection	4P3D	
Neutral line protection	4P4D	$1 \times I_n$

(1) If the temperature is higher than 40°C, the thermal protection characteristics should be corrected. Please refer to the temperature derating table for details.

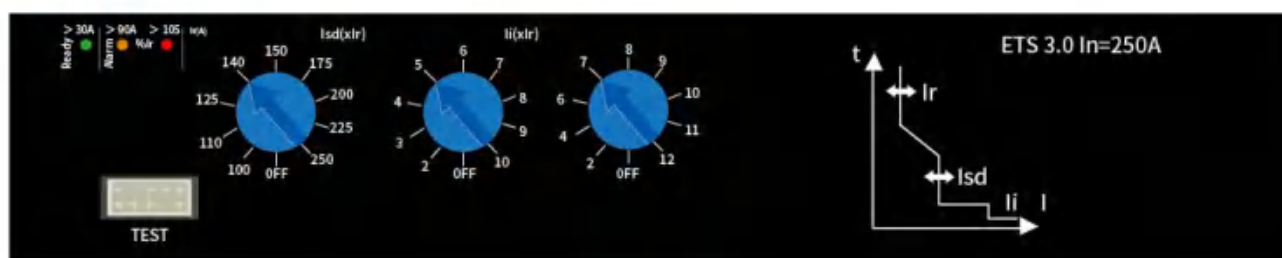
ZQM8X low-voltage molded case circuit breaker

Functions and characteristics

ETS tripping unit can be used for ZQM8X-100 to 630 circuit breaker with breaking level of N/H/S, and can provide:

- ◆ Standard distribution cable protection
- ◆ Instructions:
- ◇ Overload local indication (via LED)

Distribution system protection ETS 3.0 tripping unit.



The circuit breaker equipped with ETS3.0 tripping unit is used to protect the distribution system powered by transformer. For generators and long cables, ETS3.0-G tripping unit can provide a more matching protection scheme.

Protection

It can be adjusted by the knob on the tripping unit.

Overload protection: long delay protection (I_r)

The overload protection is an inverse time limit feature. The overload protection current value I_r is adjustable, and the overload protection action time t_r is not adjustable.

Short circuit short time delay protection: short circuit protection with fixed time delay (I_{sd})

The short circuit short delay current value I_{sd} is adjustable. The circuit breaker trips after a very short time delay, which can be used for selective cooperation with the lower circuit breaker.

Short Circuit Instantaneous Protection (I_i)

The instantaneous short circuit protection current value is adjustable.

Neutral line protection

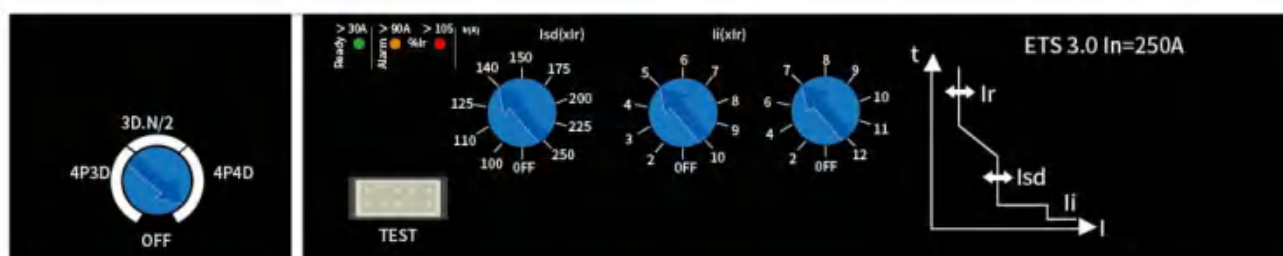
The 3-pole circuit breaker has no neutral protection.

◆ A three-position switch can be used to set the neutral line protection on the 4-pole circuit breaker.

◆ 4P3D: The neutral line is not protected.

◇ 4P3D+N/2: neutral line is half protected, neutral protection value is $0.5 \times I_r$.

◇ 4P4D: neutral line is fully protected, and the neutral line protection value is I_r .





ZQM8X low-voltage molded case circuit breaker

Indication



Local indication

Green "Ready" ready LED indicator: the LED flashes slowly when the circuit breaker is in the protection ready state

Orange overload pre-alarm LED indicator: When $I > 90\% I_r$, the orange LED indicator will be on for a long time.

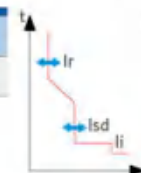
Red overload alarm LED indicator: When $I > 105\% I_r$, the red LED indicator will be on for a long time.



Technical parameters



ETS 3.0							
Rated current (A)	$I_n 40^\circ\text{C}^{(1)}$	40	100	160	250	400	630
Circuit breaker	ZQM8X-100	■	■	—	—	—	—
	ZQM8X-160	■	■	■	—	—	—
	ZQM8X-250	■	■	■	■	—	—
	ZQM8X-400	—	—	—	—	■	—
	ZQM8X-630	—	—	—	—	■	■



L long delay protection											
Tripping current set value (A)		I_r	Rated current value of tripping unit (I_n) and setting value on knob								
	$I_n=40A$	$I_r=$	18	18	20	23	25	28	32	36	40
	$I_n=100A$	$I_r=$	40	45	50	55	63	70	80	90	100
	$I_n=160A$	$I_r=$	63	70	80	90	100	110	125	150	160
	$I_n=250A$	$I_r=$	100	110	125	140	160	175	200	225	250
	$I_n=400A$	$I_r=$	160	180	200	230	250	280	320	350	400
	$I_n=630A$	$I_r=$	250	280	320	350	400	450	500	570	630
Delay (s)	t_r	Not adjustable									
Accuracy 0 to $\pm 10\%$		$1.5 \times I_r$	64								
		$6 \times I_r$									
		$7.2 \times I_r$									
Thermal memory	20 minutes before tripping or after tripping										
S_0 Short circuit short time delay protection with fixed delay											
Tripping current set value (A)	$I_{sd}=I_r \times \dots$	2	3	4	5	6	7	8	9	10	
Accuracy $\pm 10\%$											
Delay (ms)	t_{sd}	Irregulable									
	Non-tripping time	20									
	Maximum breaking time	80									
I short-circuit instantaneous protection											
Tripping current setting value (A)	I_i adjustable	2	4	6	7	8	9	10	11	12	
Accuracy $\pm 10\%$	Non-tripping time	10ms									
	Maximum breaking time	80ms									

(1) If the tripping unit is used in high temperature environment, the setting of ETS must consider temperature derating. See the temperature derating table for details.

ZQM8X
low-voltage molded case circuit breaker

Attachment

Insulated accessories

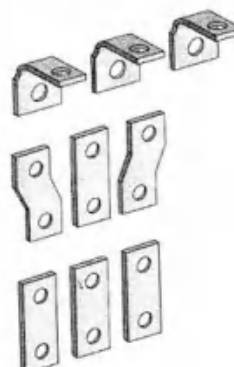


Lead-sealable terminal sheath

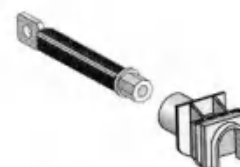


Interphase partition

Connection accessories



Terminal block

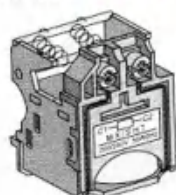


Rear terminal block

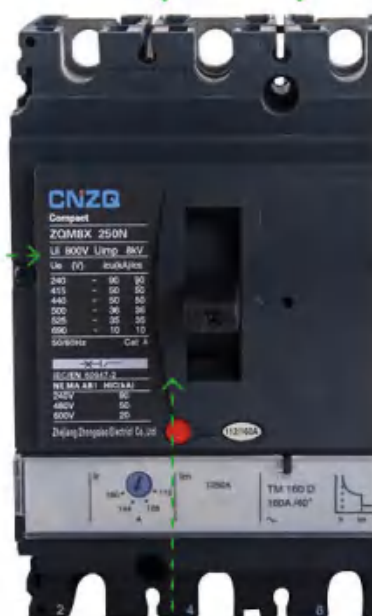
Electric attachments



Indicating contact



Voltage coil



Leakage accessories



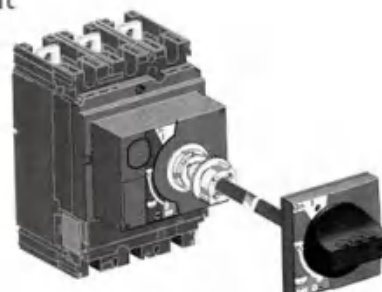
Control auxiliary equipment



Electric operating mechanism



Direct rotation handle



Extended rotary handle

ZQM8X low-voltage molded case circuit breaker

Accessories installing

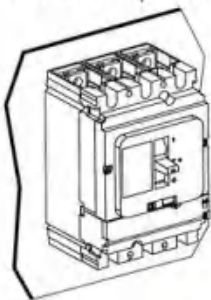
The ZQM8X circuit breaker can be installed horizontally or vertically, or horizontally or at the top, without affecting its performance. There are three installation methods:

- ◇ Fixed type
- ◇ plug-in type
- ◇ Draw-out type (400/630A only)

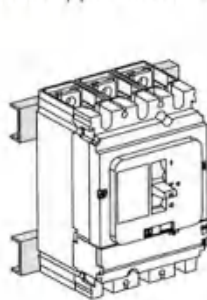
If the latter two installation methods are adopted, corresponding accessories (base, side plate, etc.) need to be added on the fixed foundation.

Fixed circuit breaker

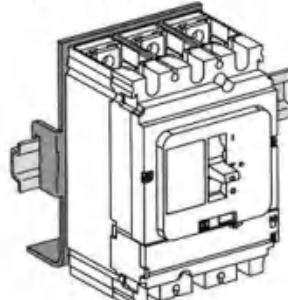
The fixed circuit breaker can be directly connected to the bus or connected to the cable through the lug. In addition, bare cable connectors are provided for bare copper wires or bare aluminum wires.



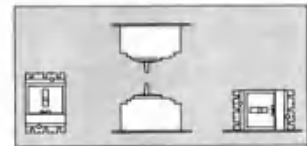
Base plate installation



DIN-Rail Mounting



DIN rail installation (with adapter).



Installation mode

Plug-in circuit breaker

The plug-in circuit breaker can:

- ◆ Pull out or quickly replace the circuit breaker without exposing the incoming and outgoing lines and installing the base.
- ◆ The plug-in base is allowed to be installed in advance to facilitate users to add circuit breakers later.
- ◆ When the circuit breaker is installed on the bottom plate or through the plate, the power supply circuit can be isolated. Complete insulation is achieved through the short terminal sheath (which must be equipped) on the equipment. The protection level is as follows:
 - ◇ Circuit breaker insertion=IP4
 - ◇ Circuit breaker withdrawal=IP2
 - ◇ The circuit breaker is taken out, and the base plate is equipped with baffle=IP4

Configuration of plug-in circuit breaker

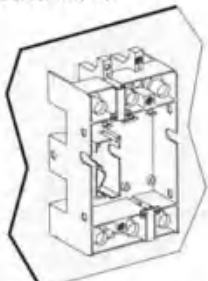
The plug-in structure is realized by adding "plug-in kit" on the fixed circuit breaker. In order to avoid connecting or disconnecting the power supply under load, before the circuit breaker is inserted or pulled out from the base, if the circuit breaker is in the ON state, the safety release device will make the circuit breaker automatically trip. This safety release device is included in the plug-in kit and must be installed on the circuit breaker.

Attachment

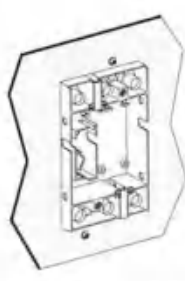
Optional insulation accessories:

- ◆ Terminal sheath to prevent direct contact with the terminal.
- ◆ Interphase partition board, which is used to enhance interphase insulation.

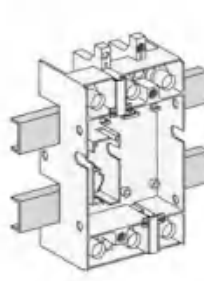
Installation



Bottom plate installation



Through-plate installation

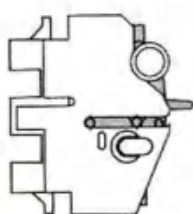


Rail mounting

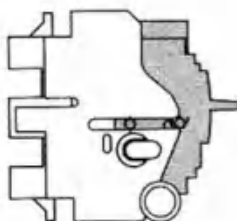


Installation mode

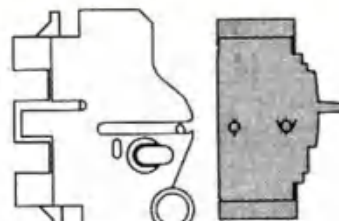
ZQM8X low-voltage molded case circuit breaker



Connection position



Extraction position



Remove the circuit breaker

Drawout circuit breaker

The draw-out type has all the advantages of the plug-in type and is very easy to operate. The draw-out circuit breaker has three positions:

- ◆ Link position: the power circuit is connected.
- ◆ Extraction position: the power circuit is disconnected, and the circuit breaker can be operated to check the auxiliary circuit.
- ◆ Remove the circuit breaker: the circuit breaker can be removed from the base.

Configuration of drawout circuit breaker

In the configuration of draw-out circuit breaker, two side plates need to be installed on the base and circuit breaker respectively. Similar to the plug-in configuration, when inserting or withdrawing the circuit breaker, if the circuit breaker is in the closing ON state, the safety release device will automatically release the circuit breaker, so that the insertion or withdrawal operation can be performed at the "off" position.

Attachment

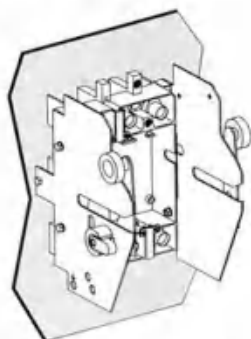
The base used is the same as the plug-in base, in addition:

- ◆ Draw frame auxiliary contact, indicating the "connection position" and "draw out position" of the circuit breaker
- ◆ Locking with 1 to 3 padlocks (5 to 8mm in diameter) can realize:
 - ◇ Prevent inserting the circuit breaker.
 - ◇ Lock the circuit breaker in the "connection position" or "extraction position".
- ◆ By pulling the switch sheath, the circuit breaker can ensure the appropriate protection level no matter where it is located.
- ◆ Telescopic axis for extending the rotary handle. The door can be closed when the equipment is in the "connection position" and "extraction position".

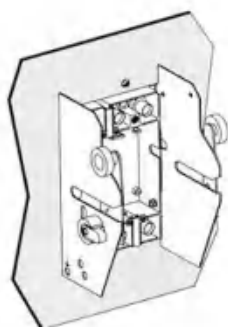


The shield used to toggle the switch can ensure the IP4 protection level in the "connected position" and "disconnected position".

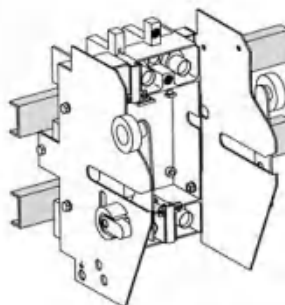
Installation



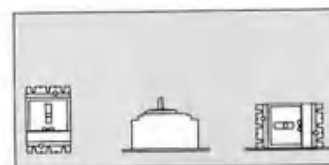
Bottom plate installation



Through-plate installation



Rail mounting



Installation mode



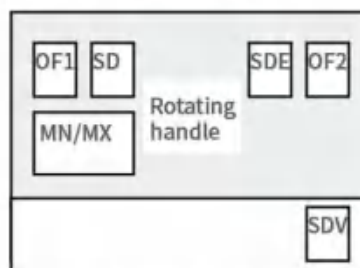
ZQM8X low-voltage molded case circuit breaker

Accessory indicating contact

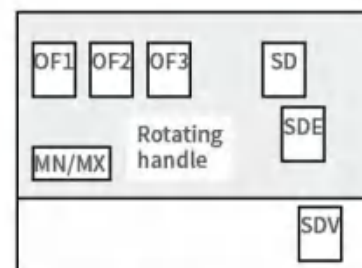
The indicating contact can indicate the state of the circuit breaker (OF-SD-SDE-SDV).



For ZQM8X-100-630



ZQM8X-100/160/250



ZQM8X-400/630

Indicates the status of the circuit breaker during normal operation or after the fault occurs.
A universal contact installed in different places can provide all different indication functions:
◆ OF indicates the position of the contact of the circuit breaker.

◆ SD (trip indication) indicates that the circuit breaker has tripped for the following reasons:

- ◇ Overload
- ◇ Short circuit
- ◇ Leakage (VigiZQM8X)
- ◇ Tripping caused by voltage coil
- ◇ Press the trip button.
- ◇ The connection is cut off when the equipment is in the ON state (when the switch is closed, pull the switch out of the plug-in or withdrawable base)

After the circuit breaker is reset, the SD contact is reset.

◆ SDE (Fault Trip Indication) indicates that the circuit breaker has tripped due to the following reasons.

- ◇ Overload
- ◇ Short circuit
- ◇ Leakage (VigiZQM8X)

◆ SDV indicates that the circuit breaker is tripped due to leakage. When Vig module is reset, the SDV is reset.

Installation

◆ OF, SD, SDE and SDV functions: the contact model is universal (the specific function depends on its position in the switch). The contact card is installed in the slot behind the front cover of the circuit breaker (in the case of SDV, in the Vigi module). To realize SDE function on ZQM8X-100-630 circuit breaker, SDE adapter is required.

Electrical characteristics

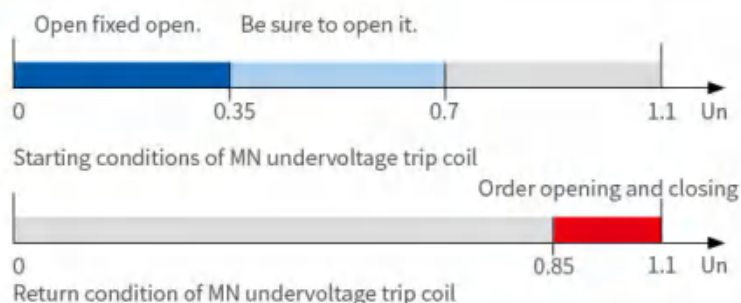
Contact			Standard				Low voltage			
Contact type			All				OF SD,SDE,SDV			
Rated load current (A)			6				5			
Minimum load			100mA at 24V DC				1mA at 4V DC			
Usage category (IEC 60947-5-1)			AC12	AC15	DC12	DC14	AC12	AC15	DC12	DC14
Operating current (A)	24V	AC/DC	6	6	6	1	5	3	5	1
	48V	AC/DC	6	6	2.5	0.2	5	3	2.5	0.2
	110V	AC/DC	6	5	0.6	0.05	5	2.5	0.6	0.05
	220V/240V	AC	6	4	-	-	5	2	-	-
	250V	DC	-	-	0.3	0.03	5	-	0.3	0.03
	380/400V	AC	6	2	-	-	5	1.5	-	-

ZQM8X low-voltage molded case circuit breaker

MN undervoltage trip coil



MX or MN voltage trip coil



- ◆ When the control voltage drops below the setting value of the tripping voltage, the circuit breaker trips.
- ◆ The tripping voltage setting value range is 0.35~0.7 times the rated voltage.
- ◆ When the voltage exceeds 0.85 times the rated voltage, the circuit breaker can be closed.

Characteristics		
Power Supply	V AC	50Hz:110/130-220/240-380/400
	V DC	24-125-250
Working threshold	Breaking	0.35 to 0.7Un
	Close	0.85Un
Operating range		0.85 to 1.1Un
Power consumption (VA or w)		Suction: 10- Hold: 5
Response time (ms)		50

Power Supply	Corresponding MN coil
Delay unit with fixed delay (200ms)	
48V AC	48V DC
220/240 V AC	250V DC

MX shunt trip coil

MX tripping coil opens the circuit breaker through a pulse type ($\geq 20\text{ms}$) or self-holding signal.

Opening conditions

The MX trip coil will automatically open the circuit breaker when it is powered on. When the voltage $U \geq 0.7 \times U_n$, it will definitely open.

Characteristics		
Power Supply	V AC	50Hz:110/130-220/240-380/400
	V DC	24-125-250
Working range		0.7 to 1.1Un
Power consumption (VA or w)		Suction: 10
Response time (ms)		50

Control circuit breaker through MN or MX

After MN or MX tripping coil releases the circuit breaker, it must be reset first before the circuit breaker can be closed.

MX or MX tripping has higher priority than manual closing.

If there is always a trip command, the circuit breaker will not be able to close (that is, it will be temporarily closed).

Connect the terminal with a connecting wire not exceeding 1.5mm².

ZQM8X low-voltage molded case circuit breaker

ZQM8X-100~630 electric operating mechanism



ZQM8X-100~250 electric operating mechanism



ZQM8X-400/630 Electric Operating Mechanism

1. Operating handle
2. Switch status indication (red opening, green closing and white tripping)
3. Reset
4. Terminal
5. Manual operation window
6. Manual/automatic selection switch

ZQM8X series electric operating mechanism, hereinafter referred to as electric operation, is a special accessory driven by a small permanent magnet DC motor for remote closing, breaking and re-tripping operation of 100~630A molded case circuit breaker. Electric operation is divided into two categories: ZQM8X-100/160/250 and ZQM8X-400/630.

Characteristics

Compact structure, small size, convenient installation, reliable action, and manual operation with operating handle. The product adopts the internationally advanced switching power supply technology, and its mechanical life, electrical life and reliability are comparable with the current international similar products.

ZQM8X series electric operation, AC/DC universal, wide application range of control circuit and low working current.

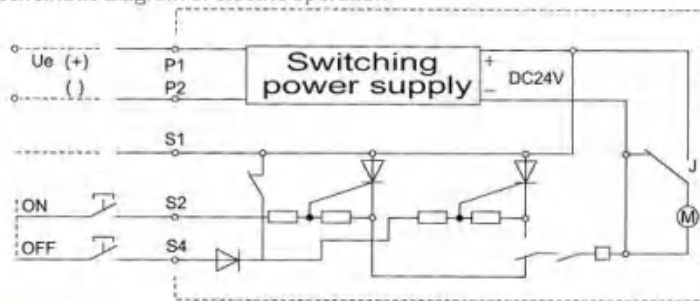
ZQM8X series electric operation can correctly display the closing, opening and tripping status of the circuit breakers.

Technical parameters

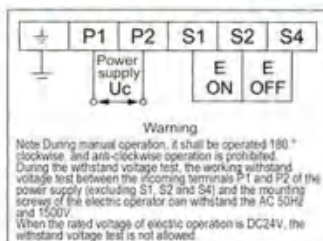
Electric operating mechanism		ZQM8X-100~250	ZQM8X-400~630
Control voltage (v)	DC	24,110,220	
	AC50/60Hz	110,240	
Action current (A)		≤ 0.5	≤ 2
	DC24V 8时	≤ 3	≤ 5
Motor power (v)		14	35
Mechanism life (times)		10000	5000

Circuit diagram

Internal concise electrical schematic diagram of electric operation



External wiring



Note: During manual operation, it shall be operated 180° clockwise, and anti-clockwise operation is prohibited.

During the withstand voltage test, the working withstand voltage test between the incoming terminals P1 and P2 of the power supply (excluding S1, S2 and S4) and the mounting screws of the electric operator can withstand the AC 50Hz and 1500V.

When the rated voltage of electric operation is DC24V, the withstand voltage test is not allowed.



ZQM8X low-voltage molded case circuit breaker

Direct rotating handle



ZQM8X-100~250 direct rotating handle



ZQM8X-100~250 extended rotary handle

Standard handle

Protection grade IP40, IK07.

The following functions can still be guaranteed by adding a direct rotating handle:

- ◆ Users can see and set the release.
- ◆ Applicability of isolation
- ◆ Indications of O (off), I (ON) and tripping positions.
- ◆ The "trip" trip test button can be contacted.

Locking

The circuit breaker can be locked by rotating the handle

◆ Padlock:

Under standard conditions, the circuit breaker can be hung with 1~3 padlocks in the off position, with a diameter of 5~8mm (provided by the user).

Extended rotary handle



ZQM8X-400/630 Direct Rotating Handle



ZQM8X-400/630 Extended Rotating Handle

Protection grade IP54, IK08.

The extended rotary handle can operate the circuit breaker installed in the switch cabinet on the door of the switch cabinet.

The following functions can still be guaranteed by installing the extended rotary handle:

- ◆ Applicability of isolation
- ◆ Indications of O (off), I (ON) and tripping positions.

Equipment and cabinet door padlock

The padlock can lock the circuit breaker handle and disable the door opening function:

- ◆ Under standard conditions, the circuit breaker can be hung with 1~3 padlocks in the off position, with a diameter of 5~8mm (provided by the user).

Composition of extended rotary handle

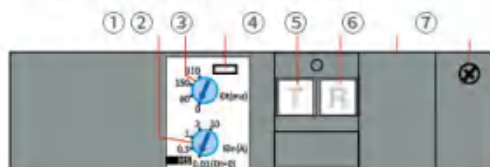
- ◆ Remove the part of the front cover of the circuit breaker (fixed with screws).
- ◆ The components (handle and nameplate) on the cabinet door are always fixed in the same position whether the circuit breaker is installed vertically or horizontally.
- ◆ The rotation axis of the extension handle can be adjusted according to the distance.

Leakage protection Vigi module

Leakage protection can be provided for all three-pole or four-pole ZQM8X-100 to 630 circuit breakers in two ways. These circuit breakers can be equipped with magnetic, thermal magnetic or ETS3, 5 or 6 tripping units.



VigiZQM8X-100 to 630



ZQM8X low-voltage molded case circuit breaker

- ① Sensitivity setting
- ② Delay setting (for selective leakage protection)
- ③ setting value lead sealing
- ④ Test button-used to simulate leakage fault, so as to regularly check the leakage protection function.
- ⑤ Reset button (reset is required after tripping of leakage fault)
- ⑥ Nameplate
- ⑦ Location of SDV auxiliary contact

Plug-in device Vigì module can be used for plug-in circuit breaker by installing special power connection device.

Circuit breaker with Vigì leakage protection module (VigìZQM8X)

- ◆ Overall characteristics of these circuit breakers.
- ◆ Vigì module. The Vigì module can be directly installed at the lower port of the circuit breaker to realize the leakage protection function. The Vigì module can act directly on the tripping unit.
- ◆ The sensitivity can be adjusted from 30mA to 30A, and the delay setting value can be adjusted.

VigìZQM8X 100 to 630 Circuit Breaker with Leakage Protection

Adding Vigì module will not change the characteristics of circuit breaker;

- ◆ Meet the standard.
- ◆ Protection grade: Class II front insulation.
- ◆ Contact indication
- ◆ Electrical characteristics
- ◆ Characteristics of trip unit
- ◆ Installation and Link Mode
- ◆ Indicating, measuring and controlling accessories
- ◆ Installation and connection accessories

Size and weight		ZQM8X-100/160/250	ZQM8X-400/630
Size	3-pole	105×236×86	140×355×110
W×H×D(mm)	4-pole	140×236×86	185×355×110
Weight (kg)	3-pole	2.5	8.8
	4-pole	3.2	10.8

Vigì leakage protection module

Compliance with standards

- ◆ IEC60947-2, Appendix B.
 - ◆ IIEC60255-4 and IEC60801-2~5 are capable of resisting transient overvoltage, lightning, switching overvoltage, electrostatic discharge and radio frequency interference.
 - ◆ IEC60755, Class A, anti-interference capacity of DC component is 6mA.
- Based on VDE664 standard, it can run at the temperature as low as -25°C.

Remote indication

Vigì module can be equipped with an auxiliary contact (SDV), which can remotely transmit the tripping caused by leakage fault.

Power Supply

The Vigì module can be powered by the power distribution system itself, so no external power supply is required. It can continue to operate even under the condition of only AC two-phase power supply.

Selection of Vigì module

Model	Vigì ME	Vigì MH	Vigì MB
Number of poles	3,4	3,4	3,4
ZQM8X-100	■	■	-
ZQM8X-160	■	■	-
ZQM8X-250	-	■	-
ZQM8X-400	-	-	■
ZQM8X-630	-	-	■
Protective characteristics			
Sensitivity I _{Δn} (A)	Fixed 0.3	Adjustable 0.03-0.3-1-3-10	Adjustable 0.3-1-3-10-30
Whether the delay is adjustable	fixed	Adjustable	Adjustable
Delay setting (ms)	< 40	0-60-150-310	0-60-150-310
Maximum breaking time (ms)	< 40	< 40 < 140 < 300 < 800	< 40 < 140 < 300 < 800
Rated voltage	200...440	200...400-440...550	200...440-440...550
Ac 50V/60Hz			

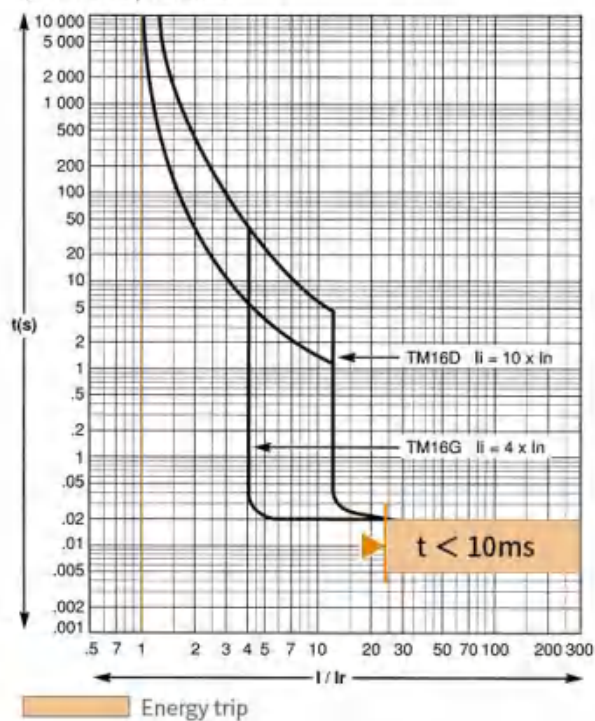
operational safety

Vigì module is a user-safe device, and users need to test it regularly (every 6 months).

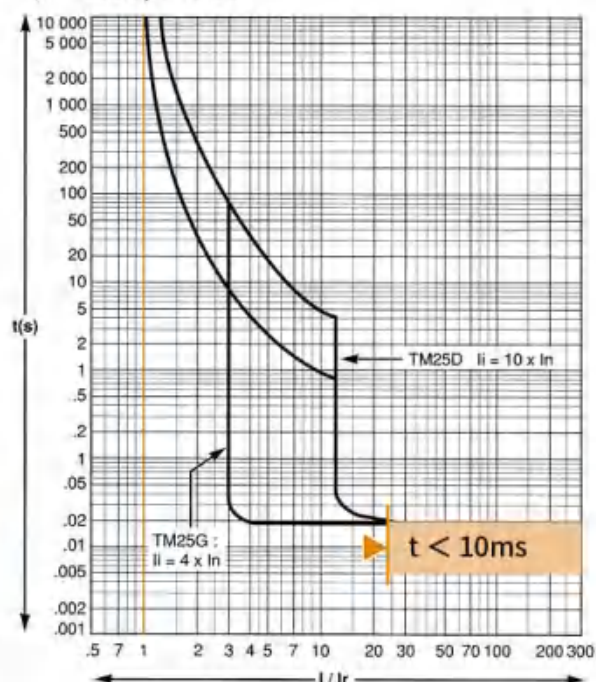
ZQM8X low-voltage molded case circuit breaker

TM Thermomagnetic Trip Unit

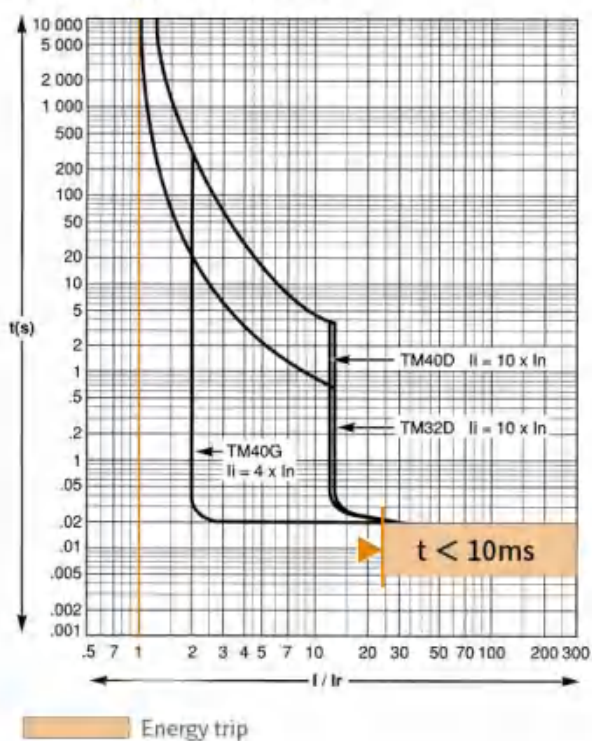
TM16D/TM16G



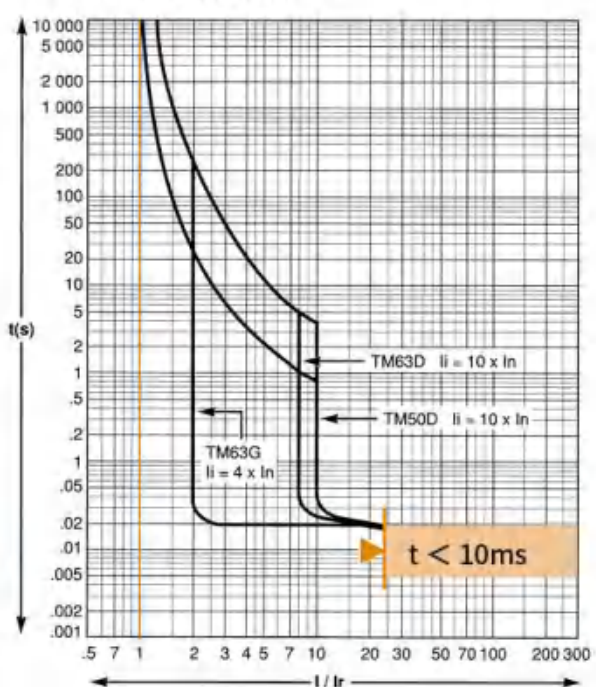
TM25D/TM25G



TM32D/TM40D/TM40G



TM50D/TM63D/TM63G

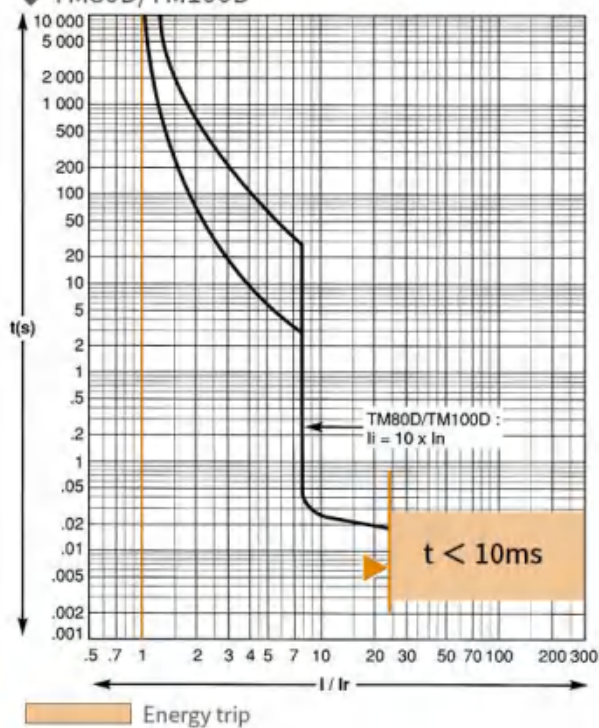




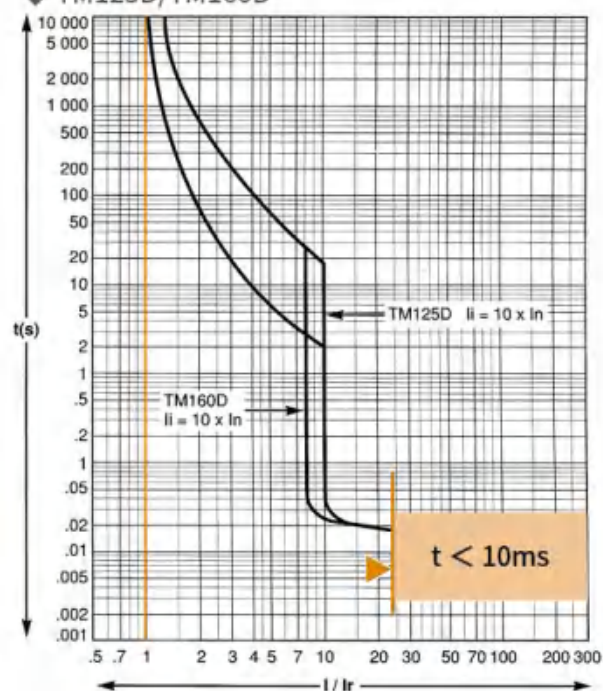
ZQM8X low-voltage molded case circuit breaker

TM Thermomagnetic Trip Unit

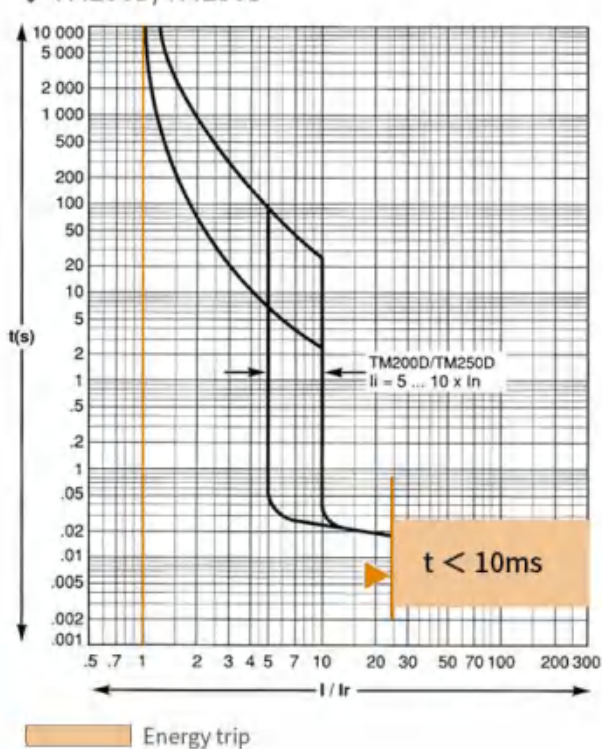
◆ TM80D/TM100D



◆ TM125D/TM160D



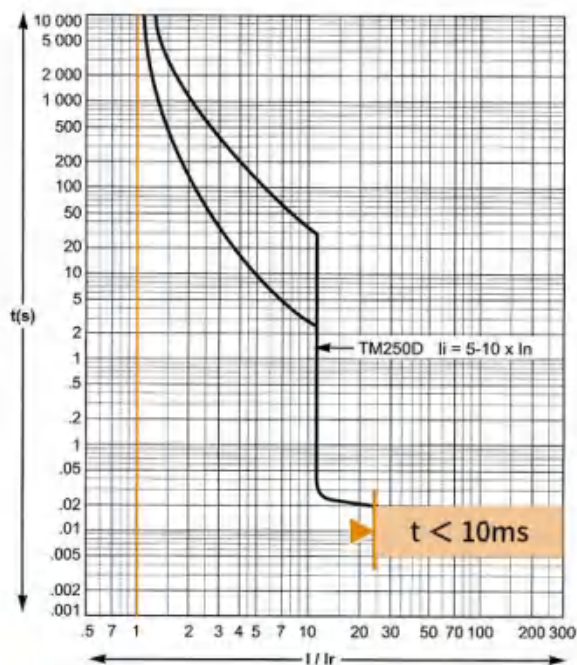
◆ TM200D/TM250D



ZQM8X
low-voltage molded case circuit breaker

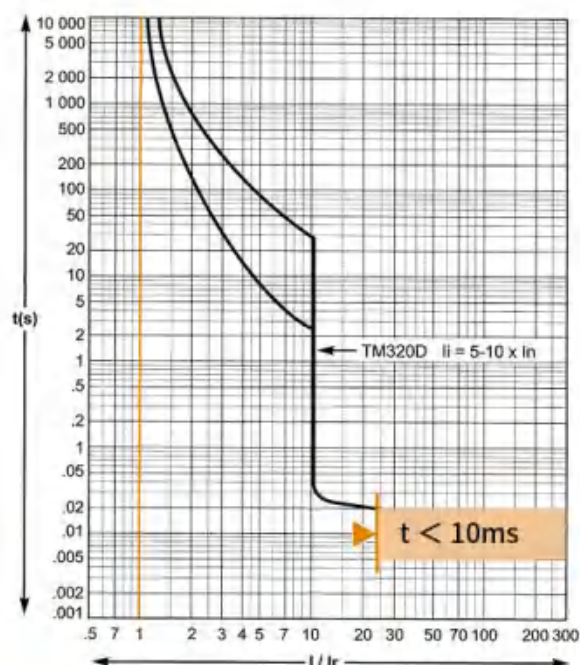
TM magnetic release

◆ 250A



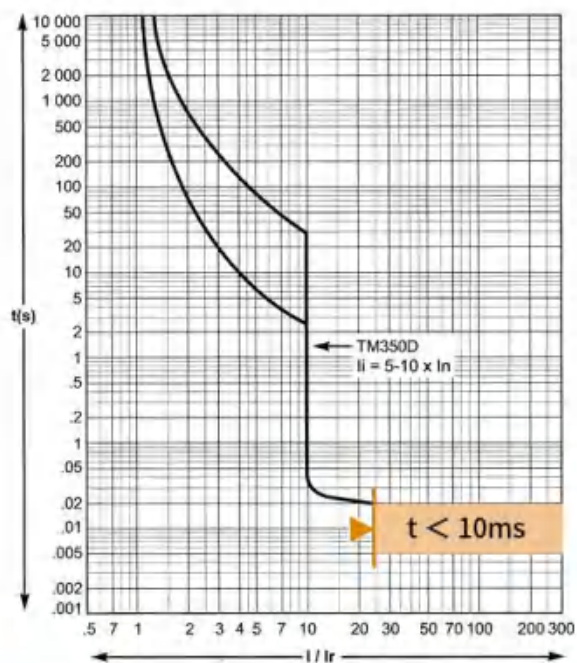
Kenke is extremely open

◆ 320A



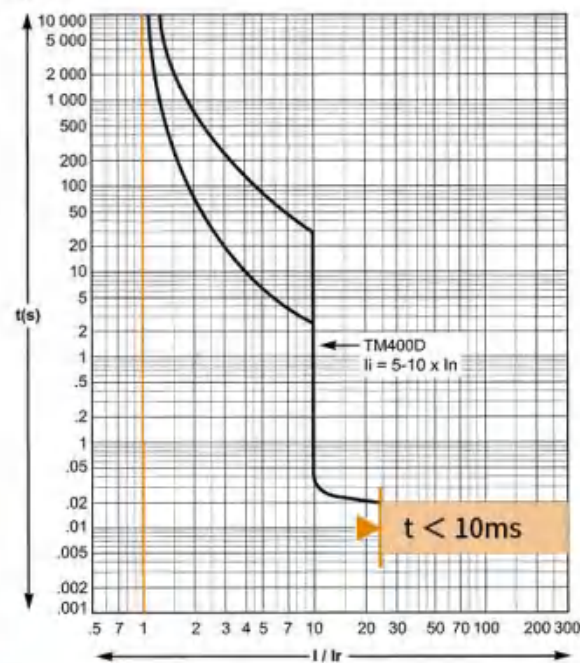
Energy trip

◆ 350A



Kenke is extremely open

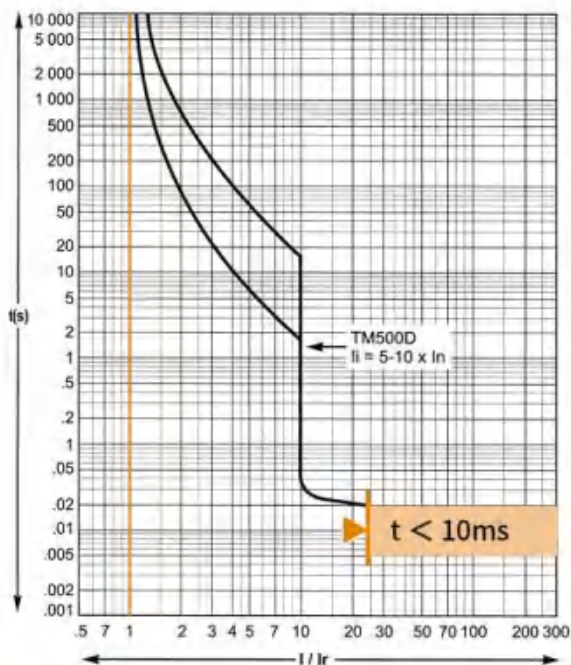
◆ 400A



Energy trip

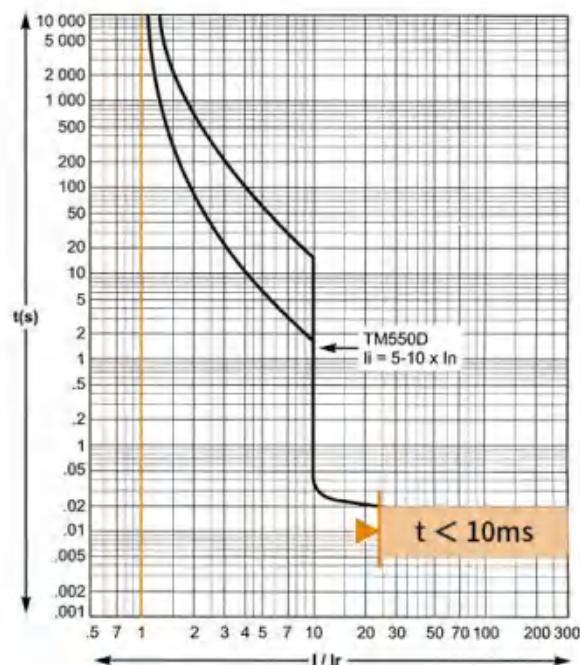
**ZQM8X**
low-voltage molded case circuit breaker**TM magnetic release**

◆ 500A



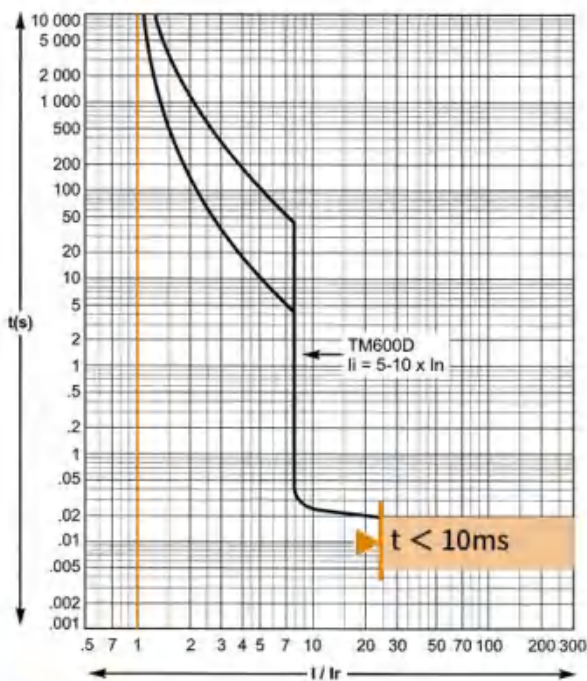
Energy trip

◆ 550A



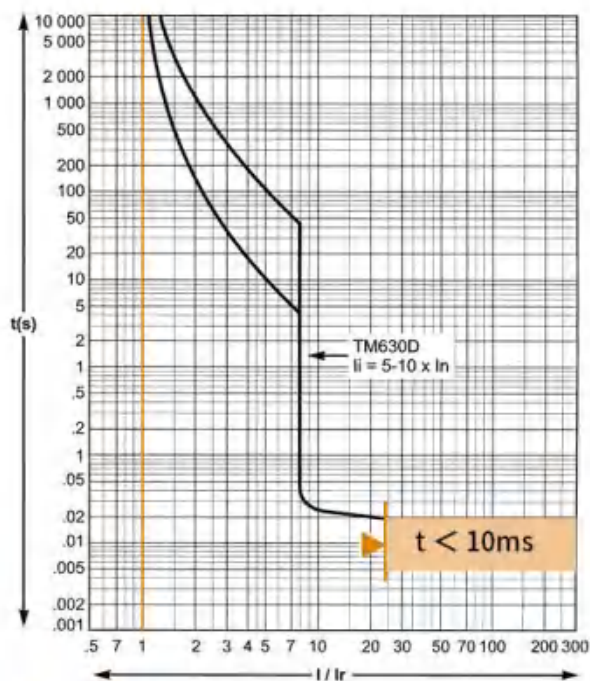
Energy trip

◆ 600A



Energy trip

◆ 630A

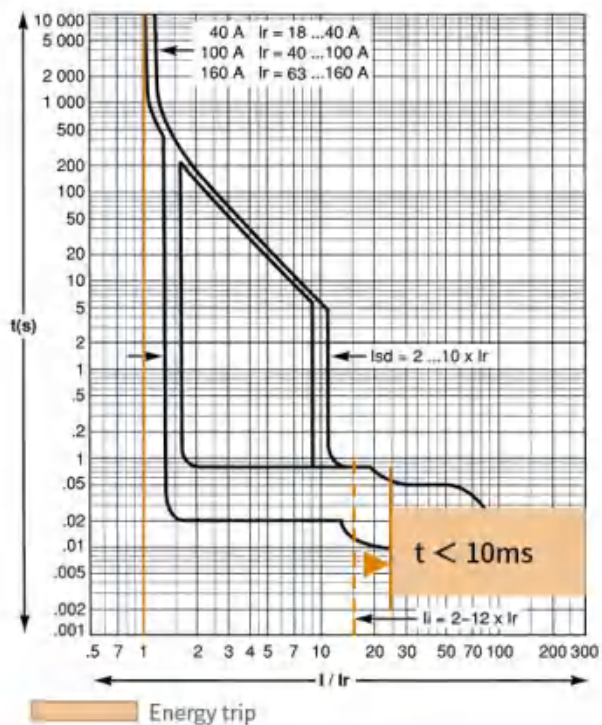


Energy trip

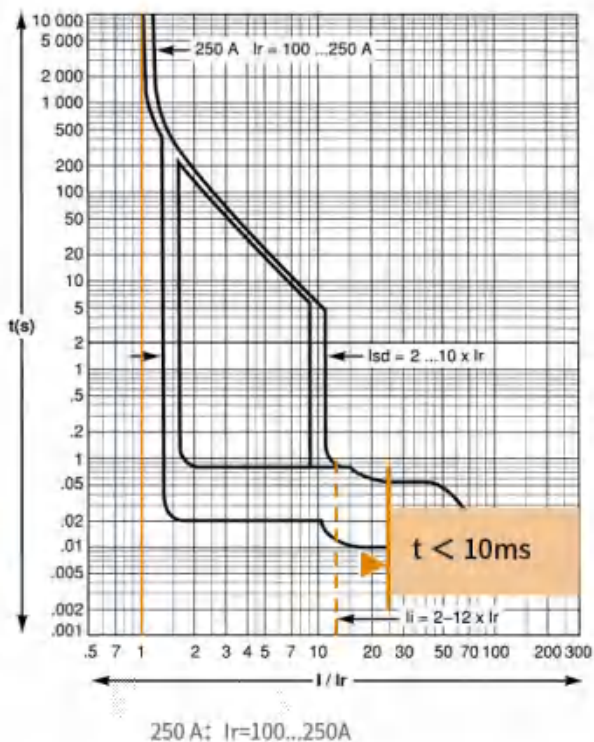
ZQM8X
low-voltage molded case circuit breaker

ETS 3.0 and 3.0 G electronic trip unit

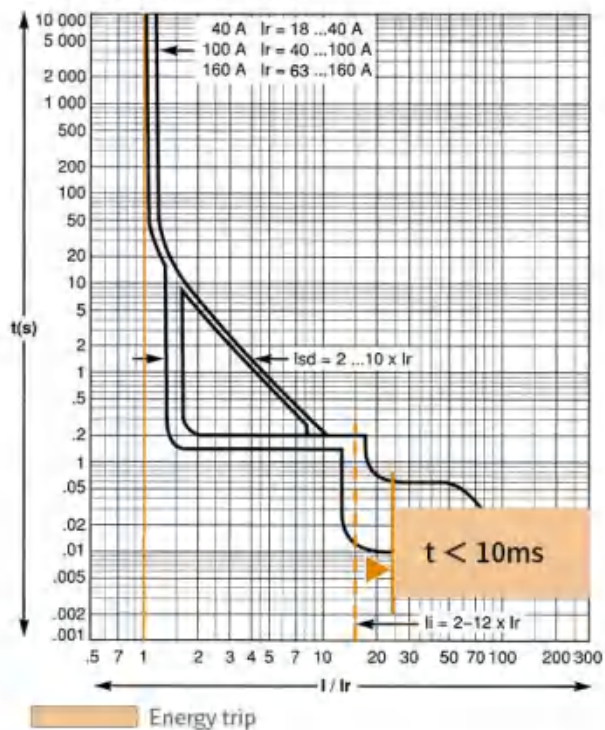
◆ ETS 3.0-40 ...160A



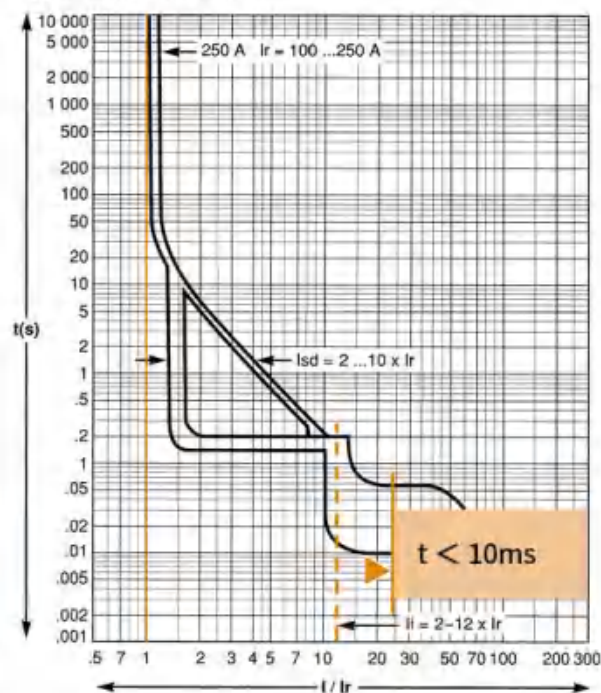
◆ ETS 3.0 - 250A



◆ ETS 3.0 G - 40...160A



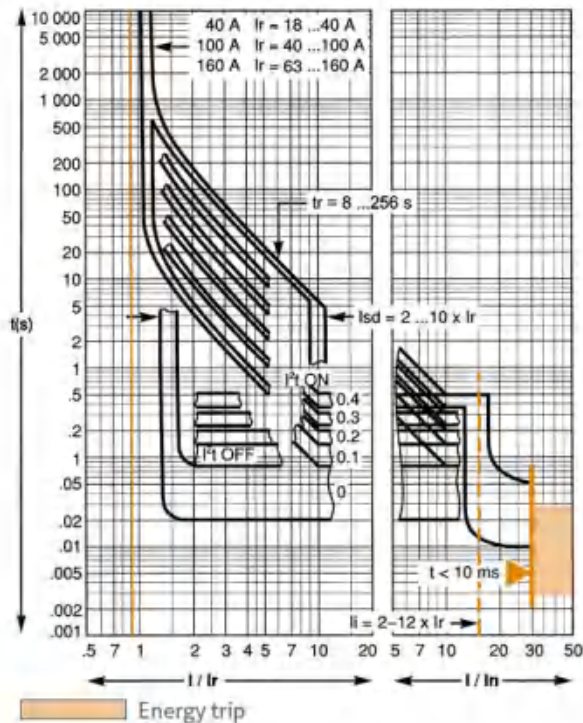
◆ ETE 3.0 G - 250A



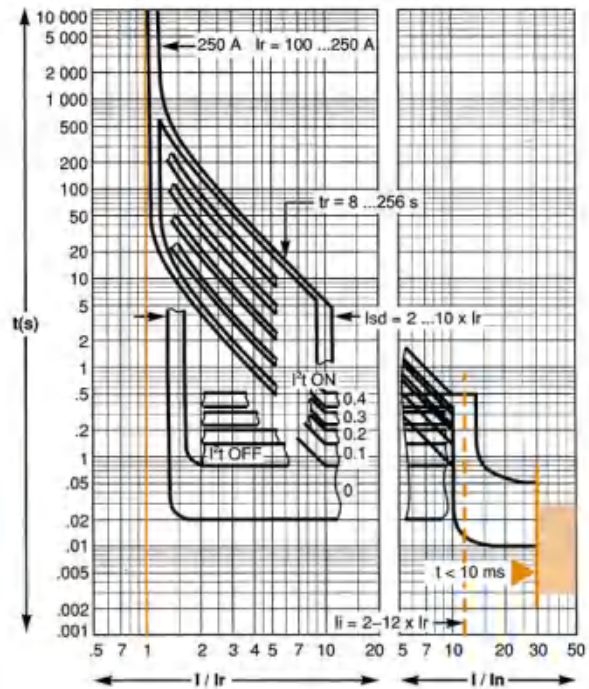
ZQM8X low-voltage molded case circuit breaker

ETS 3.0S, 5.0S/6.0A or E electronic trip unit

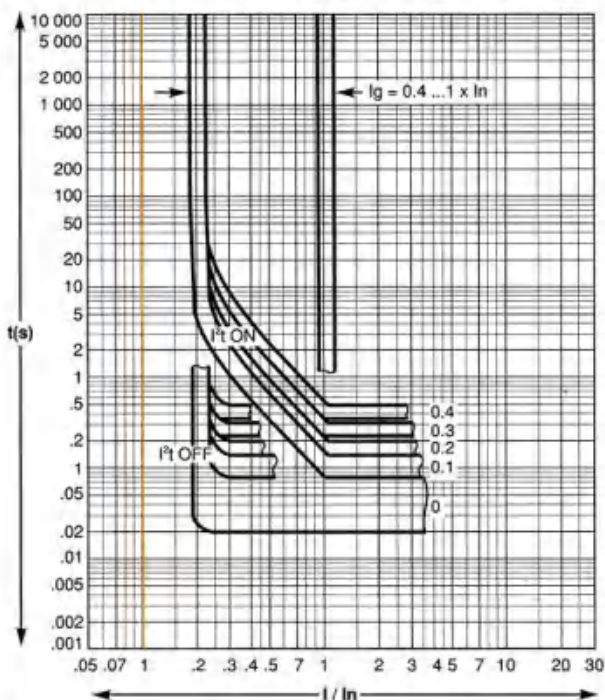
ETS 3.5S, 5.0S and 6.0A or E - 40 ...160A



ETS 3.0S, 5.0S and 6.0A or E-250A



ETS 5.0S and 6.0A or E (ground fault protection)

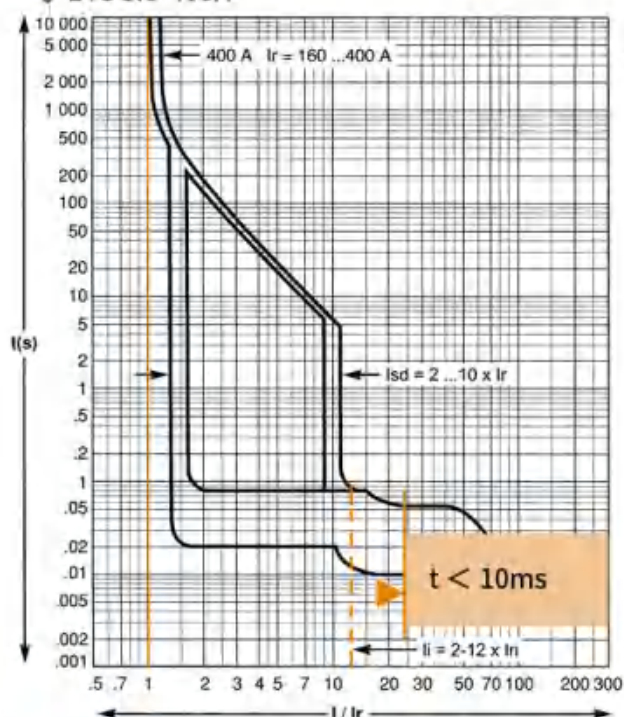


This tripping curve is the ground fault protection curve of ZQM8X ETS 5.0S/ETS 6.0A or E.

ZQM8X low-voltage molded case circuit breaker

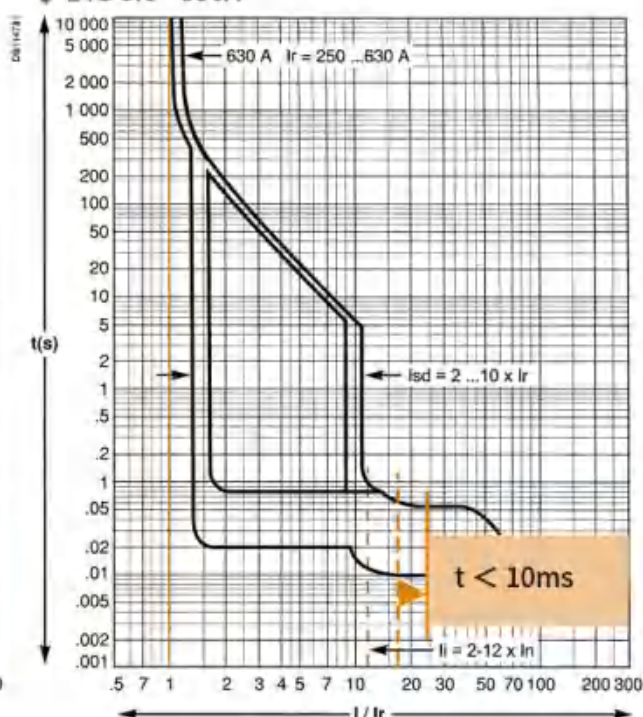
ETS 3.0, 3.0S, 5.0S and 6.0A or E electronic trip unit

ETS 3.0-400A

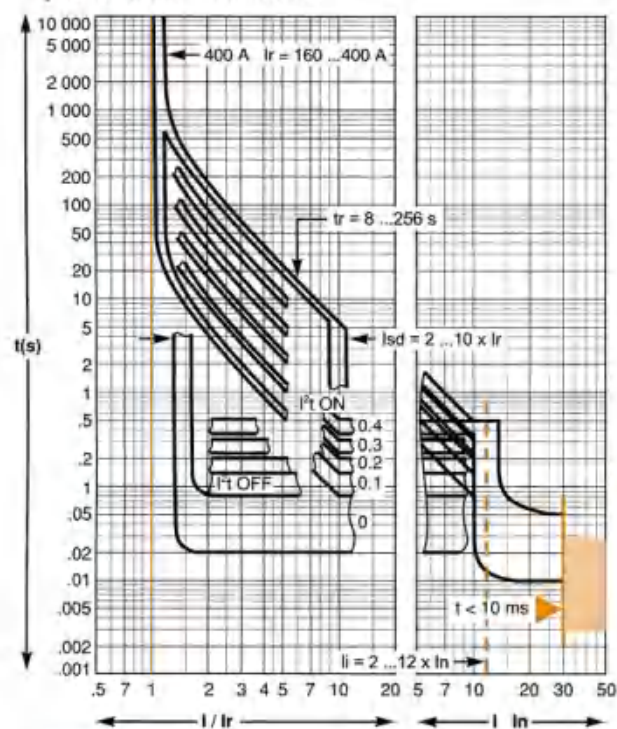


Energy trip

ETS 3.0 - 630A

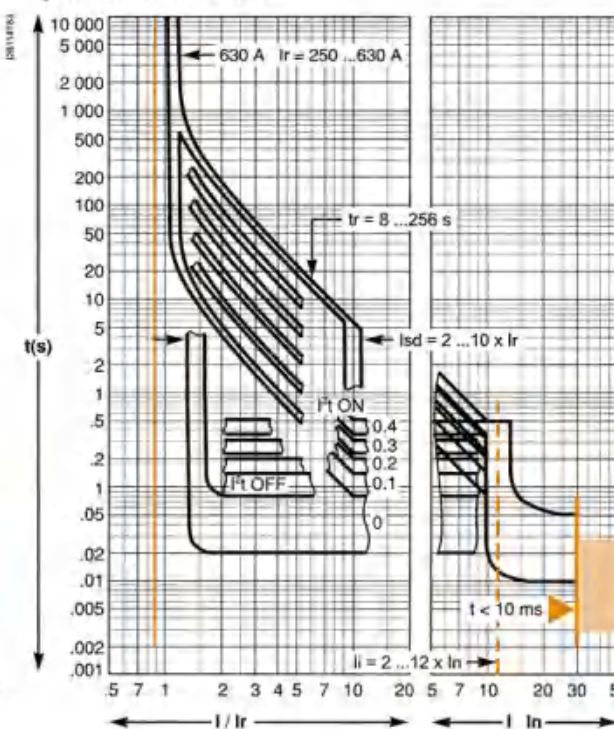


ETS 3.0 G - 40...160A



Energy trip

ETE 3.0 G - 250A



ZQM8X low-voltage molded case circuit breaker

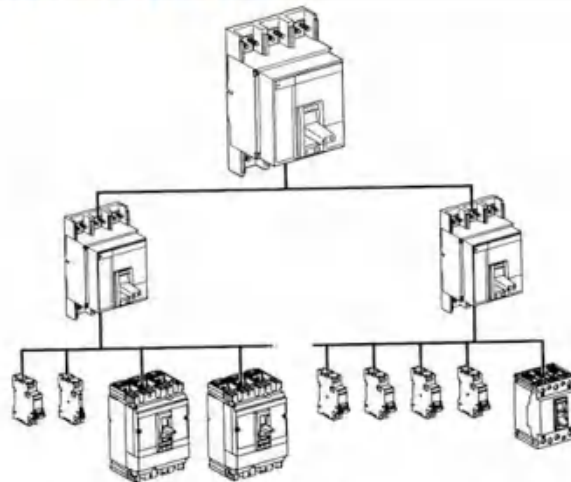
Overall characteristics



The standard features are indicated on the nameplate:

- ① Product model: product model and segment grade.
- ② Ui: rated isolation voltage.
- ③ Uimp: rated impulse withstand voltage
- ④ Ics: Use breaking ability
- ⑤ Icu: Ultimate breaking capacity
- ⑥ Ue: rated working voltage.
- ⑦ Cat: Use category A- Thermomagnetic, B- Electronic.
- ⑧ Symbol description with isolation function
- ⑨ ⑩ Reference standard

Safety selectivity as a standard feature



For various faults, ZQM8E-800~1600A and all molded case circuit breakers can achieve complete selectivity (overload, short circuit)

ZQM8E-800~1600A

Segmentation ability

Icu=Ics

415V N55kA H85kA

690V N25kA H35kA

Icw 25kA/1S

Meet the standard

ZQM8E-800~1600A circuit breakers and auxiliary equipment meet the following international standards:

- ◇ IEC 60 947-1: general rules
- ◇ IEC 60 947-2: Circuit Breaker
- ◇ IEC60 947-3: switches, isolators, disconnectors, etc.
- ◇ IEC 60 947-4: Contactor and Motor Starter
- ◇ IEC60 947-5.1 Control equipment and switches; Automatic control element

Anti-damp and heat measures

ZQM8E-800~1600A molded case circuit breaker has passed the test under strict environmental conditions specified in the following standards:

- ◇ IEC 68-2-1- Dry cooling (-55°C)
- ◇ IEC 68-2-2- Dry heat (+85°C)
- ◇ IEC 68-2-30 - Damp heat (humid heat condition 55 °C, 95% relative humidity)
- iec 68-2-52-salt mist

Environmental protection

The ZQM8E circuit breaker takes into account the current environmental protection issues, and most components can be reused, with special effective marks marked on the components.

Ambient temperature

- ◇ Ambient temperature range -25°C ~+70°C
- When the temperature is higher than 40 °C (higher than 65 °C for motor protection), derating shall be considered.
- ◇ Can work for a long time in normal environment.
- It can work in a more severe environment of - 25~- 35 °C
- ◇ The storage temperature is -50°C ~+85°C (1)

Class of pollution

The pollution level of ZQM8E-800~1600A circuit breaker is confirmed as Grade III, which meets the definition in IEC standard 60947 (industrial environment).



ZQM8X low-voltage molded case circuit breaker

Low voltage distribution and motor protection

ZQM8X circuit breaker					ZQM8E-800		ZQM8E-1000		ZQM8E-1250		ZQM8E-1600	
Number of poles					3,4		3,4		3,4		3,4	
Control	Manual	Toggle the handle directly or extend the rotary handle			● ●		● ●		● ●		● ●	
	Electric				●		●		●		●	
Circuit breaker type					N	H	N	H	N	H	N	H
Connection	fixed	Front connection			●	●	●	●	●	●	●	●
		Bare cable front connection			●	●	●	●	●	●	—	—
	Drawer type (based on drawer frame)	Rear connection			●	●	●	●	●	●	●	●
Electrical performance conforms to IEC 60947-2 and EN 60947-2 standards.												
Rated power (A)		In	50°C		800		1000		1250		1600	
			65°C (1)		800		1000		1250		1600	
Rated isolation voltage (V)		Ui			1000		1000		1000		1000	
Rated impulse withstand voltage (kV)		Uimp			8		8		8		8	
Rated working voltage (V)		Ue	AC	50/60 Hz	690		690		690		690	
Circuit breaker type					N	H	N	H	N	H	N	H
Breaking capacity (kA rms)	Icu	AC	Ultimate sectioning capacity (kA rms)	50/60 Hz 415V	55	85	55	85	55	85	55	85
					Ics	AC	Use segmentation capability (kA rms)	50/60 Hz 415V	55	85	55	85
	690V	25	35	25								
									25	35	25	35
	25	35	25	35	25	35	25	35				
25									35	25	35	25
	25	35	25	35	25	35	25	35				
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25									35	25	35	25
	25	35	25									



ZQM8X low-voltage molded case circuit breaker

Control unit ETS "basic protection type"

ETS 20,30S and 60 control units protect the power supply circuit.
ETS30S and 60 provide time selectivity in case of short circuit.

Protection

The protection threshold and delay are set by adjusting knob.
Provide standard long delay setting module.

Overpower protection

Real rms long delay protection.
Thermal memory: heat accumulation before and after tripping.

Short circuit protection

Short delay (rms) and instantaneous protection.
On the delay, I_{2t} (ON or OFF) can be selected

Neutral line protection

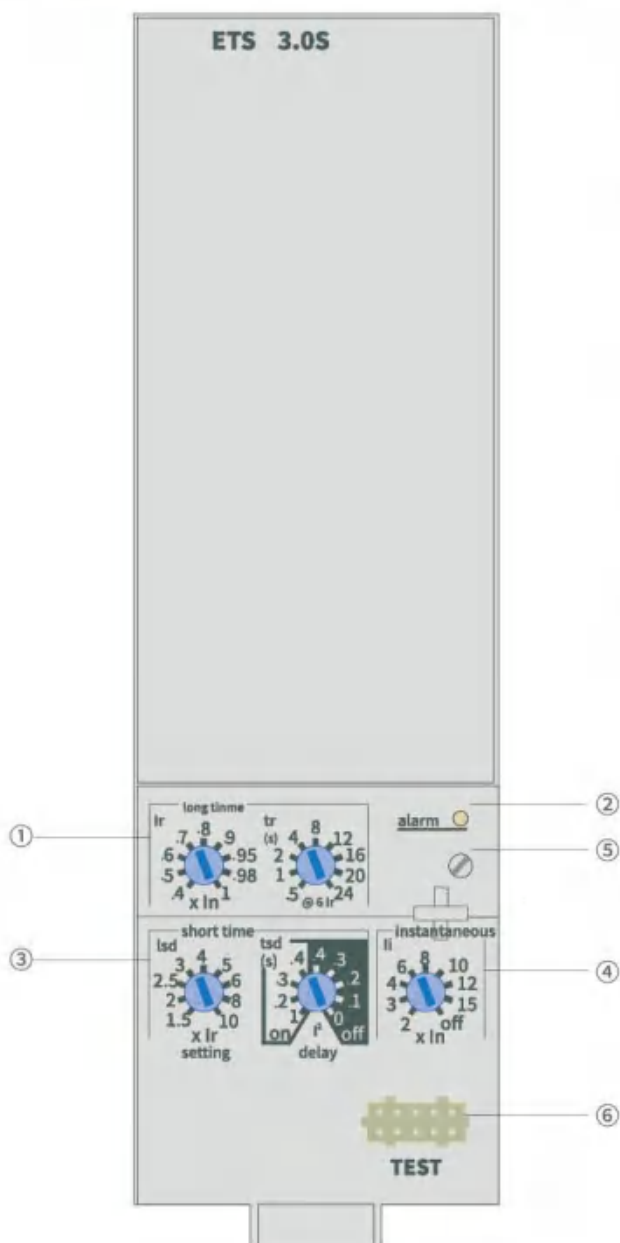
On the 3-pole circuit breaker, there is no neutral protection.
On the 4-pole circuit breaker, the neutral line protection can be set through the 3-position switch: neutral line protection (4P 3d), neutral line protection 0.5I_n(4P 3d+N/2) or neutral line full protection I_n(4P 4d).

Indication

Overload indication is realized by the alarm LED on the panel. The LED lights up when the current exceeds the setting threshold of long delay.

Test

The circuit breaker can be detected through the test hole of the control unit through the hand-held tester and the full-function test box.



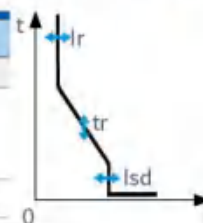
- ① Long delay current setting value and tripping delay
- ② Overload signal (LED)
- ③ Short-circuit delay current setting value and tripping delay.
- ④ Setting of instantaneous protection current
- ⑤ Fixing screw of long time delay setting module
- ⑥ Test hole

ZQM8X
 low-voltage molded case circuit breaker

Control unit ETS "basic protection type"



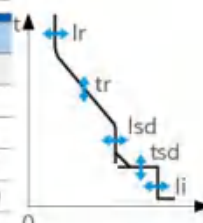
Protection		ETS 2.0									
Long delay											
Current setting (A)	$I_r = I_n \times \dots$	0.4	0.5	0.6	0.7	0.8	0.9	0.95	0.98	1	
Tripping between 1.05 and 1.20 I_r .											
Delay		$t_r(s)$	0.5	1	2	4	8	12	16	20	24
Delay (s)	Accurcy $\pm 10\%$	$1.5 \times I_r$	10	20	40	80	160	240	320	400	480
	Accurcy $\pm 10\%$	$6 \times I_r$	0.7 ⁽¹⁾	1	2	4	8	12	16	20	24
	Accurcy $\pm 10\%$	$7.2 \times I_r$	0.7 ⁽²⁾	0.69	1.38	2.7	5.5	8.3	11	13.8	16.6



(1)0~40%(2)0~60%

Instant											
Setting value (A)	$I_{sd} = I_r \times \dots$	1.5	2	2.5	3	4	5	6	8	10	
Accuracy $\pm 10\%$											
Delay		Maximum setting time: 20ms; Maximum breaking time: 80ms									

Protection		ETS 3.0S/6.0									
Long delay		ETS 3.0S									
Current setting (A)	$I_r = I_n \times \dots$	0.4	0.5	0.6	0.7	0.8	0.9	0.95	0.98	1	
Tripping between 1.05 and 1.20 I_r .											
Delay		$t_r(s)$	0.5	1	2	4	8	12	16	20	24
Delay (s)	Accuracy $\pm 10\%$	$1.5 \times I_r$ 时	10	20	40	80	160	240	320	400	480
	Accuracy $\pm 10\%$	$6 \times I_r$ 时	0.7 ⁽¹⁾	1	2	4	8	12	16	20	24
	Accuracy $\pm 10\%$	$7.2 \times I_r$ 时	0.7 ⁽²⁾	0.69	1.38	2.7	5.5	8.3	11	13.8	16.6

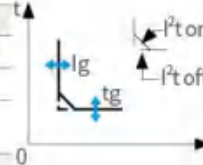


Thermal memory 20 minutes before and after tripping

(1)0~40%(2)0~60%

Short delay											
Setting value (A)	$I_{sd} = I_r \times \dots$	1.5	2	2.5	3	4	5	6	8	10	
Accuracy $\pm 10\%$											
Delay tsd(s)	Adjust	I^2t off	0	0.1	0.2	0.3	0.4				
		I^2t on		0.1	0.2	0.3	0.4				
Delay (ms) at 10 I_r	t_{sd} (maximum overcurrent time)		20	80	140	230	350				
(1 I^2t off or 1 I^2t on)	t_{sd} (maximum overcurrent time)		80	140	200	320	500				

Instant											
Setting	$I_i = I_n \times \dots$	2	3	4	6	8	10	12	15	off	
Accuracy $\pm 10\%$											
Delay		Maximum setting time: 20ms; Maximum breaking time: 60ms									

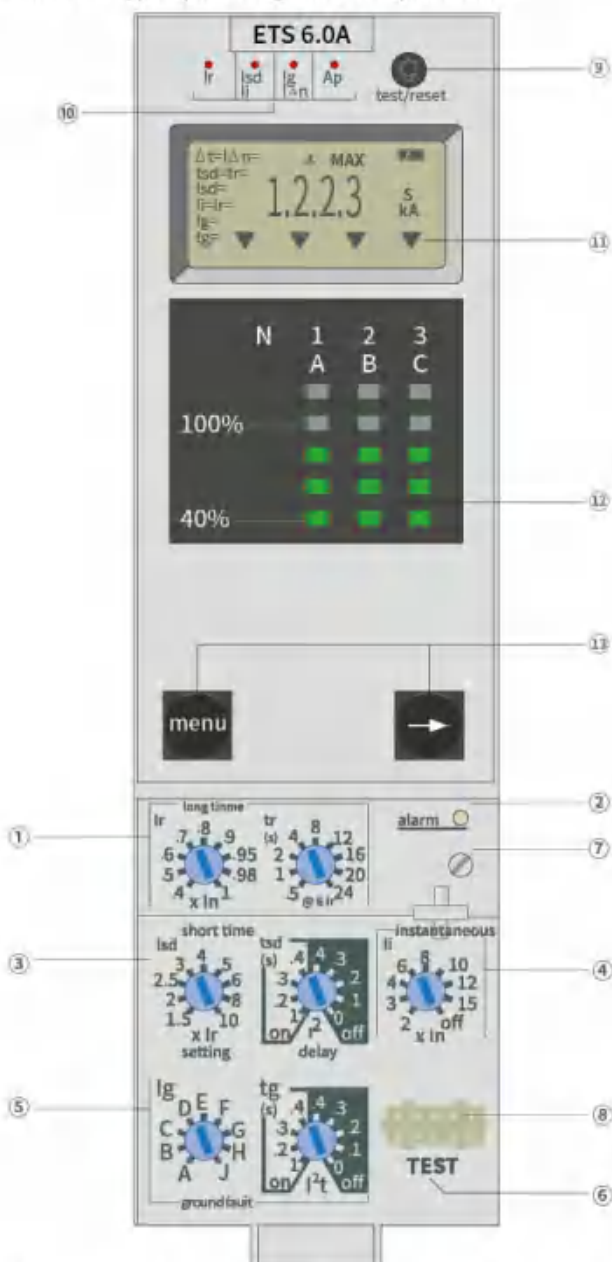


Ground fault		ETS 6.0									
Setting value (a)	$I_g = I_n \times \dots$	A	B	C	D	E	F	G	H	J	
Accuracy $\pm 10\%$	$I_n \leq 400A$	0.3	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1	
	$400A < I_n < 1250A$	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1	
	$I_n \geq 1250A$	500	640	720	800	880	960	1040	1120	1200	
Time setting (s)	整定值	I^2t off	0	0.1	0.2	0.3	0.4				
		I^2t on		0.1	0.2	0.3	0.4				
Delay I_n in or 1200A (ms)	t_s (最大复归时间)		20	80	140	230	350				
	t (最大分断时间)		80	140	200	320	500				

ZQM8X low-voltage molded case circuit breaker

Control unit ETS A "ammeter"

ETS 6.0A control unit protects the power circuit.
It also provides measurement, display and maximum value of current.
Protection type 6 provides ground fault protection.



- ① Long time delay, current setting value and tripping delay
- ② Overload signal (LED)
- ③ Short time delay, current setting value and tripping delay.
- ④ Instantaneous value
- ⑤ Ground fault and tripping delay
- ⑥ Ground fault test button

- ⑦ Long delay calibration fixing screw
- ⑧ Test hole
- ⑨ Test lamp, reset and battery test
- ⑩ Trip reason display
- ⑪ Digital display
- ⑫ Ammeter and three-phase column chart
- ⑬ Navigation keys

Protection setting

Use the adjustment button to set the protection threshold and delay. The current and time values are displayed on the screen. Provide standard long delay setting module.

Overpower protection

RMS long delay protection

Thermal reservoir; heat accumulation before and after tripping.

Short circuit protection

Short delay (rms) and instantaneous protection

On short delay, I^2t (ON or OFF) can be selected.

Ground fault protection

I^2t (ON or OFF) is optional.

Neutral line protection

No neutral line protection on 3-pole circuit breaker.

On the 4-pole circuit breaker, the neutral line protection can be set through the 3-position switch: the neutral line has no protection (4P 3t), the neutral line protection is $0.5I_n$ (4P, 3t+N/2), and the neutral line protection is I_n (4P 4t).

Zone selective interlocking (ZSI)

ZSI is connected with multiple control units to provide complete selectivity of ground fault protection and short time delay protection. No time delay is required before tripping

Ammeter

ETS control unit A measures the true effective value (RMS) of current.

The digital LCD continuously displays the maximum load phase current (I_{max}), or by pressing the navigation key. It can also display I_1 , I_2 , I_3 , I_N , I_{GT} , $I_{\Delta N}$ storage current (maximum value) and set.

The external power supply option can display the current of $<20\% I_n$.

If the current is lower than $0.05I_n$, the measured value is meaningless. At 0.05 to $0.2 I_n$, the accuracy is $0.5\% I_n + 1.5\%$ reading.

Overload alarm

The yellow LED on the control unit panel provides overload alarm indication.

Failure indication

The LED light indicates the fault type.

- ◇ Overload (I_r)
- ◇ Short circuit (I_{sd}, I_i)
- ◇ Grounding (I_g)
- ◇ Internal failure (A_p)

Battery

After the fault occurs, the trip indicator LED remains on until the test/reset button is pressed. Normally, the battery can power the LED arch for about 10 years.

Test

Small or portable test devices can detect circuit breakers through panel test holes. Corresponding to the Micrologic 6.0A control unit, the ground fault protection can be tested through the test button.

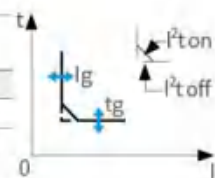
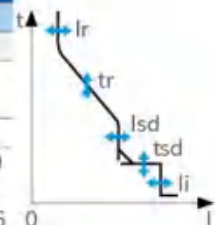
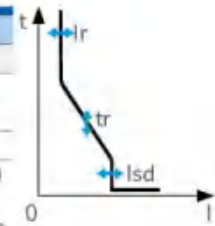
Note:

No auxiliary power supply is required for all current protection. The test/reset button resets the maximum measured value, clears the trip indication and tests the battery.

ZQM8X low-voltage molded case circuit breaker

Control unit ETS A "ammeter"

Protection measures				ETS 2.0									
Long delay													
Current setting (A)		I _r =I _n x ...		0.4	0.5	0.6	0.7	0.8	0.9	0.95	0.98	1	
Tripping between 1.05 and 1.20I _r .													
Time setting (s)		tr(S)		0.5	1	2	4	8	12	16	20	24	
Delay (s)	Accuracy: ±10%	tr(1.5×I _r 时)		10	20	40	80	160	240	320	400	480	
	Accuracy: ±10%	tr(6×I _r 时)		0.7 ⁽¹⁾	1	2	4	8	12	16	20	24	
	Accuracy: ±10%	tr(7.2×I _r 时)		0.7 ⁽²⁾	0.69	1.38	2.7	5.5	8.3	11	13.8	16.6	
(1)0--40%(2)0--60%													
Instant													
Setting value (A)		I _{sd} =I _r x...		1.5	2	2.5	3	4	5	6	8	10	
Accuracy: ±10%													
Delay				Maximum setting time: 20ms; Maximum breaking time: 80ms									
Ammeter				ETS 6.0A									
Continuous current measurement													
Measure 20 to 200%I _n .				I ₁	I ₂	I ₃	I _N						
Accuracy: 1.5% (including current transformer)				No auxiliary power supply(I > 20%I _n)									
Maximum value				I _{1maximumvalue}	I _{2maximumvalue}	I _{3maximumvalue}	I _{Nmaximumvalue}						
protection measures				ETS 6.0A									
Long delay													
Current setting (A)		I _r =I _n x ...		0.4	0.5	0.6	0.7	0.8	0.9	0.95	0.98	1	
Trip between 1.05 and 1.20I _r .													
Time setting (s)		tr(s)		0.5	1	2	4	8	12	16	20	24	
Delay (s)	Accuracy: ±10%	tr(1.5×I _r 时)		10	20	40	80	160	240	320	400	480	
	Accuracy: ±10%	tr(6×I _r 时)		0.7 ⁽¹⁾	1	2	4	8	12	16	20	24	
	Accuracy: ±10%	tr(7.2×I _r 时)		0.7 ⁽²⁾	0.69	1.38	2.7	5.5	8.3	11	13.8	16.6	
Thermal memory (1)0--40%(2)0--60%				20 minutes before and after tripping									
Short delay													
Setting value (A)		I _{sd} =I _r x...		1.5	2	2.5	3	4	5	6	8	10	
Accuracy±10%													
Time setting (s)	Setting	I ² t off		0	0.1	0.2	0.3	0.4					
		I ² t on			0.1	0.2	0.3	0.4					
At 10×I _r delay (ms)		t _{sd} (maximum overcurrent time)		20	80	140	230	350					
		t _{sd} (maximum breaking time)		80	140	200	320	500					
Instant													
Setting value (a)		I _i =I _n x...		2	3	4	6	8	10	12	15	off	
Accuracy ±10%													
Delay				Maximum setting time: 20ms; ; Maximum breaking time: 60ms									
Ground fault				ETS 6.0									
Setting value (A)		I _g =I _n x ...		A	B	C	D	E	F	G	H	J	
Accuracy: ±10%			I _n ≤ 400A	0.3	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1	
			400A < I _n < 1250A	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1	
			I _n ≥ 1250A	500	640	720	800	880	960	1040	1120	1200	
Time setting (s)	Setting value	I ² t off		0	0.1	0.2	0.3	0.4					
		I ² t on			0.1	0.2	0.3	0.4					
Delay I _n in or 1200A (ms)		t _g (maximum reset time)		20	80	140	230	350					
		t(maximum breaking time)		80	140	200	320	500					
Ammeter				ETS 6.0A									
Continuous current measurement													
Measure 20 to 200%I _n .				I ₁	I ₂	I ₃	I _N	I _g					
Accuracy: 1.5% (including current transformer)				No auxiliary power supply(I > 20%I _n)									
Maximum value				I _{1maximumvalue}	I _{2maximumvalue}	I _{3maximumvalue}	I _{Nmaximumvalue}	I _{gmaximumvalue}					





ZQM8X low-voltage molded case circuit breaker

Electrical and mechanical accessories ZQM8E-800~1600A



OF, SD and SDE switching contacts

All auxiliary contacts can be replaced by "small capacity" contacts for switching very small loads (such as for controlling PLC or electronic circuits).

Indicating contact

Contacts installed in circuit breakers

The changeover contact is used for remote control of circuit breaker status information, so it can be used for display, electric locking, relay control, etc. Comply with IEC 60947-5 international standard.

Function

- ◆ OF(ON/OFF) indicates the position of main contact of circuit breaker.
- ◆ SD (tripping indication) indicates that the circuit breaker has been tripped for the following reasons:
 - ◇ Overload
 - ◇ Short circuit
 - ◇ Voltage coil action
 - ◇ "Push to trip": trip button operation.
 - ◇ When the circuit breaker is ON, disconnect it and return to the open state when the circuit breaker is reset.

◆ SDE (fault indication) indicates that the circuit breaker has tripped for the following reasons.

- ◇ Overload
- ◇ Short circuit

Return to the open state when the circuit breaker is reset.

◆ CAF/CAO (pre closing or pre opening function) indicates the position of rotary handle. Especially for advance opening of safety tripping device Energize the control device before switching on (pre opening) or closing the circuit breaker.

Installation

◆ SD and SDE function single type contacts perform different indication functions according to their positions installed in the circuit breaker. The contact is fixed in the long hole behind the front cover of the circuit breaker.

◆ The CAF/CAO function contact is installed in the rotary handle device (direct or extended). Electrical characteristics of OF/SD/SDE/CAF/CAO auxiliary contacts

Contact		Standard				Small capacity			
Rated thermal current (A)		6				5			
Minimum load		100mA at 24V				1mA at 4V			
Type of use (IEC 60947-5-1)		AC12	AC15	DC12	DC14	AC12	AC15	DC12	DC14
Operating current (A)	24V	6	6	6	1	5	3	5	1
	48V	6	6	2.5	0.2	5	3	2.5	0.2
	110V	6	5	0.6	0.05	5	2.5	0.6	0.05
	220V/240V	6	4	-	-	5	2	-	-
	250V	-	-	0.3	0.03	5	-	0.3	0.03
	380/440V	6	2	-	-	5	1.5	-	-
	480V	6	1.5	-	-	5	1	-	-
	660/690V	6	0.1	-	-	-	-	-	-

ZQM8X low-voltage molded case circuit breaker

Electrical and mechanical accessories ZQM8E-800~1600A

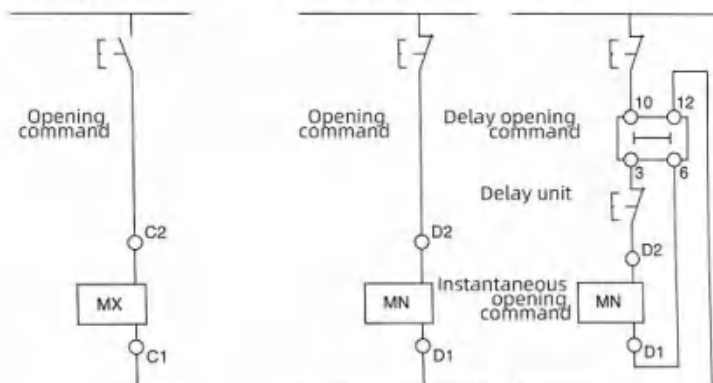


MX voltage trip coil

Voltage trip

This functional element opens the circuit breaker through an electric command. The component of the element can be a shunt coil (MX) or an undervoltage trip coil (MN) or a delayed undervoltage trip coil (MN+delay unit). The delay unit is installed outside the circuit breaker, and the emergency opening OFF button can be used to momentarily open the circuit breaker to cancel the delay.

Wiring diagram of remote control release functional element



Voltage tripping coil (MX)

When the MX voltage tripping coil is energized, the circuit breaker will open instantaneously. The continuous power supply of MX locks the circuit breaker in the OFF position.

Characteristics		
Power Supply	V AC 50/60Hz	24-48-100/130-200/250-277-380/480
	V DC	12-24/30-48/60-100/130-200/250
Working range		0.7-1.1Un
Continuous locking function		0.85-1.1Un
Energy consumption (VA or W)		Suction: 200(200ms)
		Hold: 4.5
Response time of Un short circuit breaker		50ms±10

S instantaneous undervoltage coil (MN)

When the power supply voltage of MN drops to 35% - 70% of its rated voltage. MN causes the circuit breaker to open instantaneously.

If MN loses power, it is impossible to close the circuit breaker manually or electrically. Any attempt to switch on will not lead to the main contact. When the power supply voltage of the coil recovers to 85% of its rated value, the circuit breaker can be closed again.

characteristics		
Power Supply	V AC 50/60Hz	24-48-100/130-200/250-277-380/480
	V DC	24/30-48/60-100/130-200/250
Working range	Opening activation	0.35-0.7un
Continuous locking function	Closing activation	0.85Un
Energy consumption (VA or W)		Suction: 200(200ms)- Hold: 4.5
	MN Energy consumption with delay unit (VA or W)	Suction: 200(200ms)- Hold: 4.5
Response time of Un short circuit breaker		90ms±5

MN, MX voltage coil wiring

In the process of suction, the initial power is about 150-200 VA. In the case of low power supply voltage (12,24,48V), the maximum cable length depends on the power supply voltage and cable size.

ZQM8X low-voltage molded case circuit breaker

		12V		24V		48V	
		2.5mm ² 1.5mm ²		2.5mm ² 1.5mm ²		2.5mm ² 1.5mm ²	
MN	100%U power supply voltage	-	-	58	35	280	165
	85%U power supply voltage	-	-	16	10	75	45
MX-XF	100%U power supply voltage	21	12	115	70	550	330
	85%U power supply voltage	10	6	75	44	350	210

Note: The above length refers to one of the two power conductors.

Electrical and mechanical accessories ZQM8E-800~1600A



ZQM8E-800 to 1600A with direct rotating handle



ZQM8E-800~1600A with extended rotary handle

Rotary handle

There are two kinds of rotating handles:

- ◆ Direct rotation handle
- ◆ Extended rotary handle

There are two models:

- ◆ Standard type, black handle
- ◆ Yellow cover and red handle for machine tool control

Direct rotary handle

Protection level IP40, IK07

The direct rotary handle has the following characteristics:

- ◆ Visual tripping setting value
- ◆ Suitable for isolation.
- ◆ Indicating O(OFF),I(ON) and tripping positions.
- ◆ The "Push to trip" button can be operated.
- ◆ One to three padlocks can be used to lock the circuit breaker in the OFF position, and the shackle diameter is 5-8mm (not provided) handle replaces the front cover of the circuit breaker.

The accessories change the following conditions of the standard direct rotation handle:

- ◆ MCC switch board:
 - ◇ Unable to open the door when the circuit breaker is
 - ◇ The circuit breaker cannot be closed when opening the door.
- ◆ High protection level (IP 43, IK 07) machine control, in line with CNOMO E03.81.501, IP54, IK07

Extended rotary handle

Protection level IP55, IK07

The handle on the front of the switch board can operate the circuit breaker installed on the back of the switch board.

The handle has the following characteristics:

- ◆ Suitable for isolation.
- ◆ Indicating O(OFF),I(ON) and tripping positions.
- ◆ Visual trip setting when the switch panel door is opened.
- ◆ One or three padlocks can be used to lock the circuit breaker in the OFF position, and the shackle diameter is 5-8mm (not provided).The door cannot be opened when it is ON or locked.

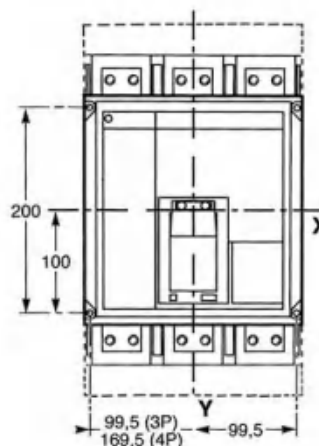
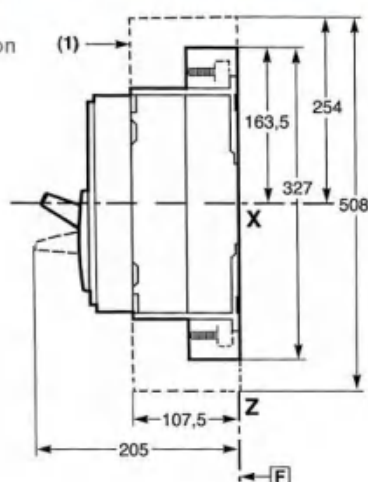
Components of extended rotary handle:

- ◆ Replace a part of the front cover of the circuit breaker (fixed with bolts)
- ◆ A device (handle and front plate) on the door. Whether the circuit breaker is installed vertically or horizontally, the device is always fixed in the same position.
- ◆ An extension shaft. The axis must be adjusted for distance. The minimum/maximum distance between the back of the circuit breaker and the door is 218/605mm

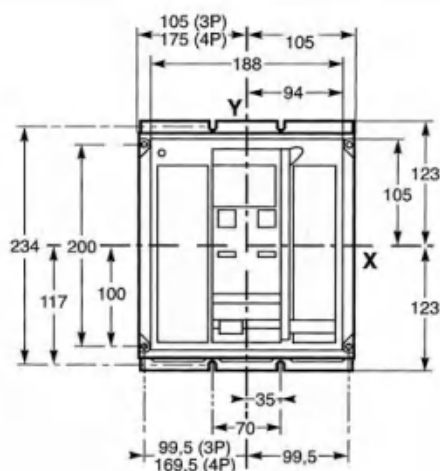
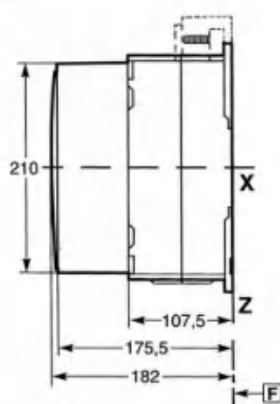
ZQM8X low-voltage molded case circuit breaker

Fixed shape and installation dimensions

- ◆ Manual control
Front connection

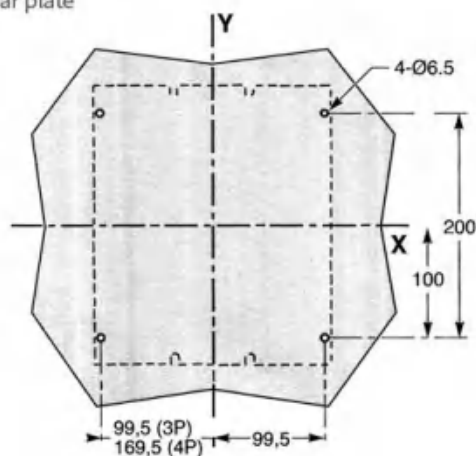


- ◆ Electrical control
Front connection

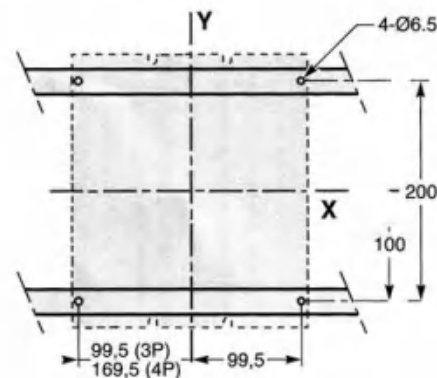


F datum point

- ◆ Front plate connection
Rear plate



On the guide rail

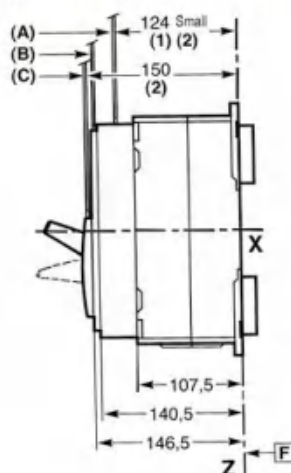


Note: X and Y are the symmetry plane of the 3-pole circuit breaker
Z is the rear plane of the circuit breaker

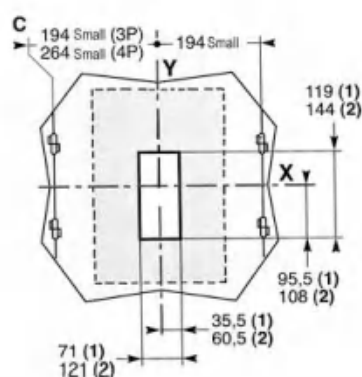
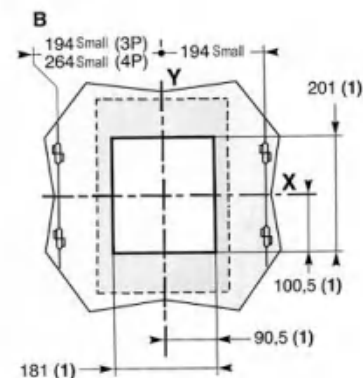
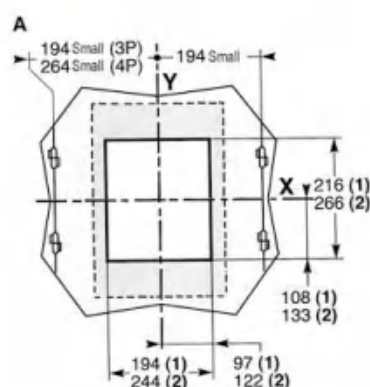
ZQM8X
low-voltage molded case circuit breaker

Electrical and mechanical accessories ZQM8E-800~1600A

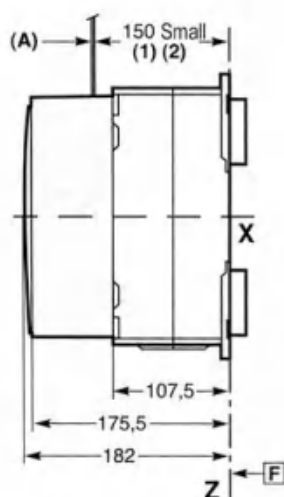
◆ **Handle operation**



F Datum point
 (1) No door frame
 (2) With door frame

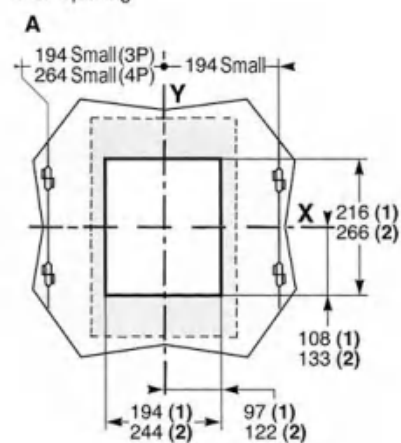


◆ **Electrical control**



F Datum point
 (1) No door frame
 (2) With door frame

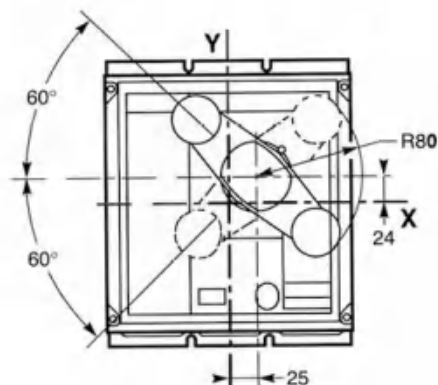
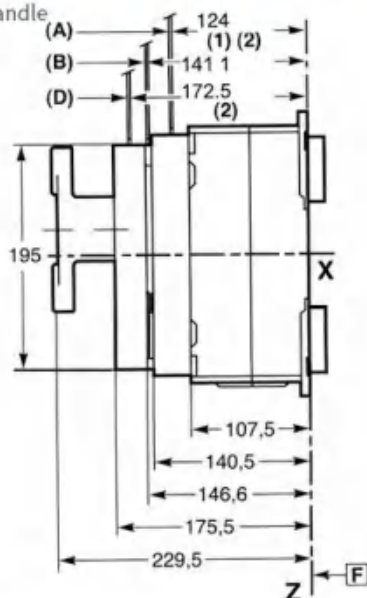
Door opening



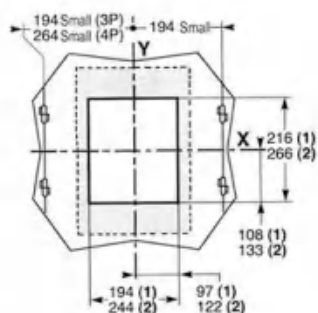
ZQM8X low-voltage molded case circuit breaker

Fixed shape and installation dimensions

◆ Direct rotary handle Measurement

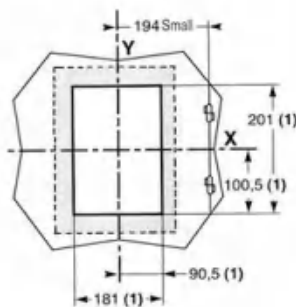


◆ Door opening A

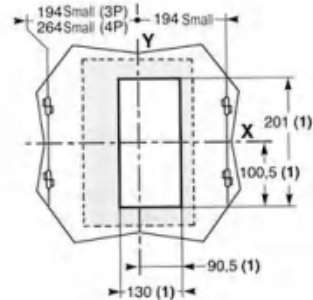


(1) No door frame
 (2) With door frame

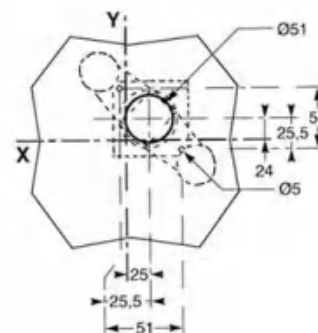
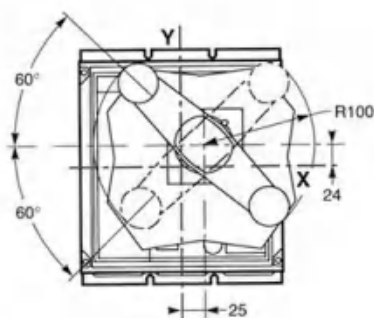
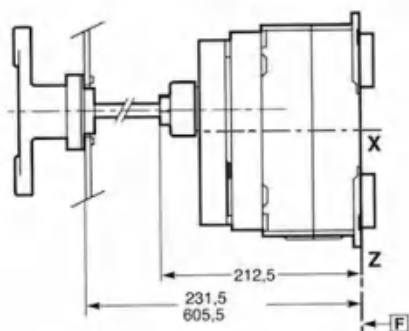
B



C



◆ Extended rotary handle Measurement



[F] Datum point

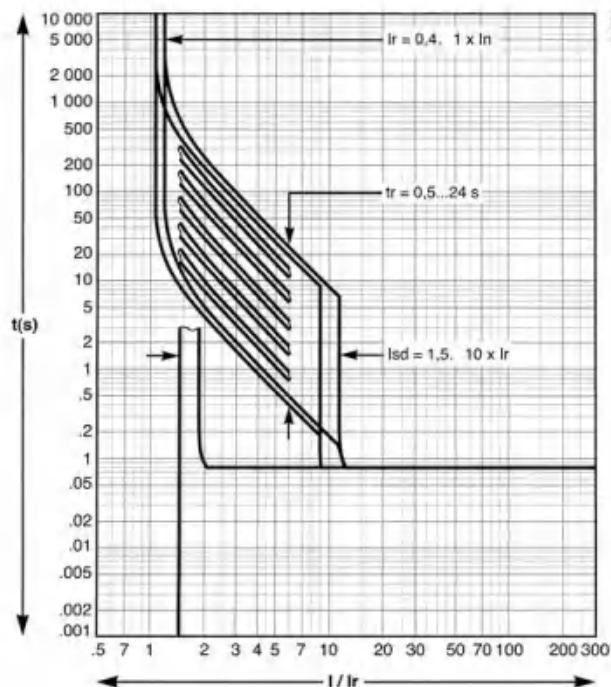
Note: X and Y are the symmetry plane of the 3-pole circuit breaker
 Z is the rear plane of the circuit breaker



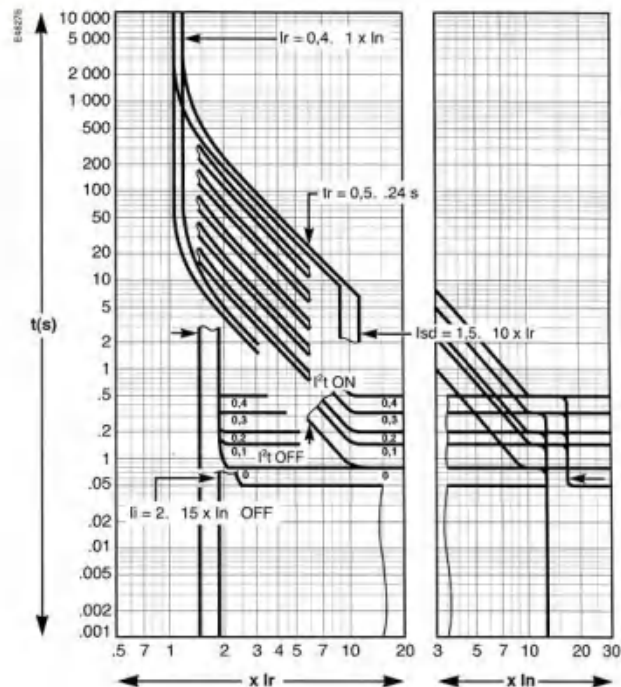
ZQM8X low-voltage molded case circuit breaker

Electrical and mechanical accessories ZQM8E-800~1600A

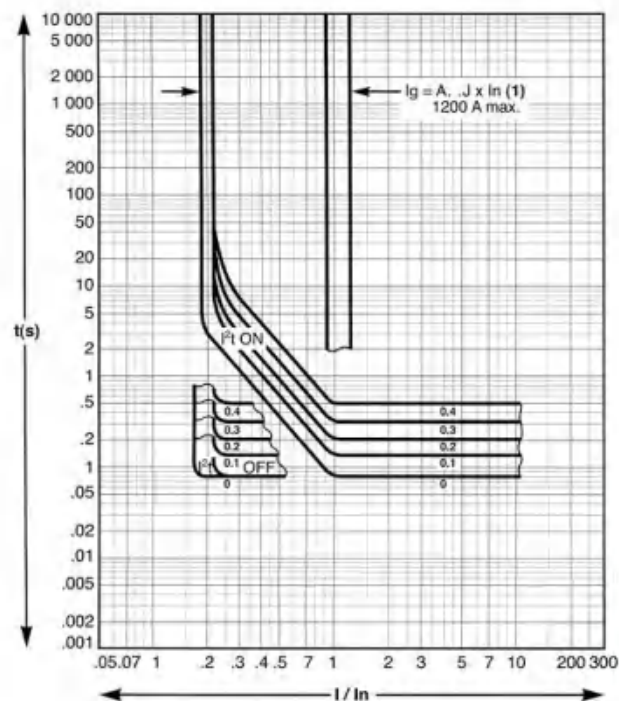
◆ ETS 2.0



◆ ETS 3.0S, 6.0



◆ Ground fault protection (ETS 6.0)



(1)

Ig=In x...	A	B	C	D	E	F	G	H	J
Ig < 400A	0.3	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1
400 A ≤ Ig ≤ 1200A	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1
Ig > 1200A	500	640	720	800	880	960	1040	1120	1200

CNZQ[®]

Striving for perfection is the driving force that we have been insisting on. Grasp every detail to make the product more perfect.



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- Intelligent universal circuit breaker
- Molded case circuit breaker**
- Intelligent molded case circuit breaker
- Leakage molded case circuit breaker
- Miniature circuit breaker
- Self-resetting overvoltage and undervoltage
- dual power switch
- Load disconnecter
- Contactors thermal relay
- Branch/busbar

ZQM3T

Plastic housing circuit breaker



ZQM3T Plastic housing circuit breaker



ZQM3T M1



ZQM3T M2



ZQM3T M3



ZQM3T M4



ZQM3T M5



ZQM3T M6



ZQM3T M7

Product overview

- ◇ ZQM3T series circuit breakers can work normally under the ambient temperature of - 25°C to +70°C, and the ambient temperature for storage is - 40°C to +70°C. The thermal element of circuit breaker with thermal magnetic release is set at +40°C.
- ◇ When the temperature is lower or higher than +40 °C, the limit value of the thermal trip door of the circuit breaker with the same setting will change. See the relevant chapters of this volume for details. The performance of microprocessor overcurrent release will not change with the temperature, but when the temperature is higher than +40 °C, it is necessary to consider the heating phenomenon on the copper part of the circuit breaker with phase current flowing, and the maximum setting value of overload protection function (L function) needs to be reduced, see relevant chapters of this volume for details.
- ◇ According to the relevant operating and storage environment requirements of IEC 60947-1 and GB14287, the normal allowable operating temperature environment range of low-voltage circuit breaker is - 5 °C to +70 °C. If the actual operating conditions exceed the range specified in the standard, please consult Zhongqiao Electric.
- ◇ The performance of the circuit breaker cannot be guaranteed when the temperature is higher than +70 °C.
- ◇ In order to ensure the continuity of power equipment operation, it is necessary to consider how to maintain the temperature at the temperature at which all equipment can work normally, rather than only consider the operating temperature of the circuit breaker. If necessary, strong ventilation should be taken in the switch cabinet and equipment room.

Model meaning

ZQM3 T-160 TMD R125 F F·C 3P

- Number of poles
3P: level 3, 4P: level 4.
- Main connection mode
Standard configuration:
F·C: cable wiring, F: front wiring
- Installation method
F: fixed, p: plug-in
- Rated current In
- Release type
- Shell frame current In(M1, M2, M3, M4, M5, M6, M7)
- Short circuit breaking capacity (B, C, N, H, L V)
- Shell frame number

Altitude

- ◇ The performance of ZQM3T circuit breaker will not change at an altitude below 2000 meters. When the altitude exceeds 2000 meters, the composition, insulation performance, cooling performance and pressure in the atmosphere will change, so the circuit breaker will be derated. These changes can be reflected by measuring those important parameters. Example: maximum working voltage, rated uninterrupted current.

Altitude	[m]	2000	3000	4000	5000
Rated operating voltage Ue	[V]	690	600	500	440
Rated uninterrupted current Iu	%	100	98	93	90

Electromagnetic compatibility

- ◇ The use of electronic release and residual current release can make the release avoid false release caused by electronic equipment, atmospheric interference or discharge. And it will not interfere with the surrounding electronic equipment. This is in accordance with the provisions of IEC 60947-2 Annex F and the relevant standards of electromagnetic compatibility in European Directive 89/336.



ZQM3T Plastic housing circuit breaker

List of electrical characteristics

			ZQM3T M1			ZQM3T M2				ZQM3T M3	
Rated uninterrupted current Iu		[A]	160			160				250	
Number of poles		[No.]	3/4			3/4				3/4	
Rated operating voltage Ue	(AC) 50-60 Hz	[V]	690			690				690	
	(DC)	[V]	500			500				500	
Rated impulse withstand voltage Uimp		[kV]	8			8				8	
Rated isolation voltage Ui		[V]	800			800				800	
Power frequency test voltage for 1 minute		[V]	3000			3000				3000	
Rated limit short circuit breaking capacity Icu			B	C	N	N	S	H	L	N	S
(AC) 50-60 Hz 220/230 V		[kA]	25	40	50	65	85	100	120	50	85
(AC) 50-60 Hz 380/400/415 V		[kA]	16	25	36	36	50	70	85	36	50
(AC) 50-60 Hz 440 V		[kA]	10	15	22	30	45	55	75	25	40
(AC) 50-60 Hz 500 V		[kA]	8	10	15	25	30	36	50	20	30
(AC) 50-60 Hz 690 V		[kA]	3	4	6	6	7	8	10	5	8
(DC) 250 V - 2 poles in series		[kA]	16	25	36	36	50	70	85	36	50
(DC) 250 V - 3 poles in series		[kA]	20	30	40	40	55	85	100	40	55
(DC) 500 V - 2 poles in series		[kA]	-	-	-	-	-	-	-	-	-
(DC) 500 V - 3 poles in series		[kA]	16	25	36	36	50	70	85	36	50
(DC) 750 V - 3 poles in series		[kA]	-	-	-	-	-	-	-	-	-
Rated operating short circuit breaking capacity Ics											
(AC) 50-60 Hz 220/230 V		[%Icu]	100%	75%	75%	100%	100%	100%	75%	75%	50%
(AC) 50-60 Hz380/400/415V		[%Icu]	100%	100%	75%	100%	100%	100%	75%	75%	50%
(AC) 50-60 Hz 440 V		[%Icu]	100%	75%	50%	100%	100%	100%	75%	75%	50%
(AC) 50-60 Hz 500 V		[%Icu]	100%	75%	50%	100%	100%	100%	75%	75%	50%
(AC) 50-60 Hz 690 V		[%Icu]	100%	75%	50%	100%	100%	100%	75%	75%	50%
Rated short-circuit connection capacity Icm											
(AC) 50-60 Hz 220/230 V		[kA]	52.5	84	105	143	187	220	264	105	187
(AC) 50-60 Hz 380/400/415 V		[kA]	32	52.5	75.6	75.6	105	154	187	75.6	105
(AC) 50-60 Hz 440 V		[kA]	17	30	46.2	63	94.5	121	165	52.5	84
(AC) 50-60 Hz 500 V		[kA]	13.6	17	30	52.5	63	75.6	105	40	63
(AC) 50-60 Hz 690 V		[kA]	4.3	5.9	9.2	9.2	11.9	13.6	17	7.7	13.6
Opening time (415 V)		[ms]	7	6	5	3	3	3	3	7	6
Usage category (IEC 60947-2)			A			A				A	
Reference standards			IEC 60947-2			IEC 60947-2				IEC 60947-2	

◇ When I_n=16A and I_n=20A, the breaking capacity is set to 16kA.

1) 75% is applicable to M5 630.

2) 50% is suitable for M5 630.

3) I_{cw} = 5 kA

4) I_{cw} = 7.6 kA (630A)-10kA (800A)

5) Only applicable to M7 800/1000/1250A.

6) I_{cw} = 20 kA (S, H, L)-15kA (V)

Note: at 40°C, the maximum set values of M2 and M3 plug-in and M5 630 pull-out need to be reduced by 10%.



ZQM3T

Plastic housing circuit breaker

List of electrical characteristics

ZQM3T M4					ZQM3T M5					ZQM3T M6				ZQM3T M7			
250					400/630					630/800				800/1000/1250/1600			
3/4					3/4					3/4				3/4			
690					690					690				690			
750					750					750				-			
8					8					8				8			
1000					1000					1000				1000			
3500					3500					3500				3500			
N	s	H	L	V	N	S	H	L	V	N	S	H	L	s	H	L	V
70	85	100	200	200	70	85	100	200	200	70	85	100	200	85	100	200	200
36	50	70	120	200	36	50	70	120	200	36	50	70	100	50	70	120	150
30	40	65	100	180	30	40	65	100	180	30	45	50	80	50	65	100	130
25	30	50	85	150	25	30	50	85	150	25	35	50	65	40	50	85	100
20	25	40	70	80	20	25	40	70	80	20	22	25	30	30	42	50	60
36	50	70	100	150	36	50	70	100	150	36	50	70	100	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
25	36	50	70	100	25	36	50	70	100	20	35	50	65	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
16	25	36	50	70	16	25	36	50	70	16	20	36	50	-	-	-	-
100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	75%	100%	100%	100%	100%
100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	75%	100%	100%	100%	100%
100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	75%	100%	100%	100%	100%
100%	100%	100%	100%	100%	100%	100%	100%	100% ¹⁾	100% ²⁾	100%	100%	100%	75%	100%	100%	75%	100%
100%	100%	100%	100%	100%	100%	100%	100% ¹⁾	100% ²⁾	100% ²⁾	75%	75%	75%	75%	100%	75%	75%	75%
154	187	220	440	660	154	187	220	440	660	154	187	220	440	187	220	440	440
75.6	105	154	264	440	75.6	105	154	264	440	75.6	105	154	220	105	154	2G4	330
63	84	143	220	396	63	84	143	220	396	63	94.5	105	176	105	143	220	286
52.5	63	105	187	330	52.5	63	105	187	330	52.5	73.5	105	143	84	105	187	220
40	52.5	84	154	176	40	52.5	84	154	176	40	46	52.5	63	63	88.2	105	132
5	5	5	5	5	6	6	6	6	6	10	9	8	7	15	10	8	9
A					B (400 A) ³⁾ - A (630 A)					B (630 A - 800 A) ⁴⁾ - A (1000 A)				B ⁶⁾			
IEC 60947-2					IEC 60947-2					IEC 60947-2				IEC 60947-2			

ZQM3T
Plastic housing circuit breaker

List of electrical characteristics

				ZQM3T M1	ZQM3T M2	ZQM3T M3
Isolation function				■	■	■
Release:						
Thermomagnetic type	TMF	T iadjustable,M inot adjustable.		-	-	-
	TMD	T is adjustable, M is not.		■	■	■
	TMA	T adjustable, M adjustable (5...10 x In)		-	-	-
	TMG	T adjustable, M not adjustable (3 x In)		-	■ 2)	■
	TMG	T adjustable, M adjustable (2.5...5 x In)		-	—	-
Single magnetic type	MA			-	■ (MF up to In12.5A)	■
Electronic type	ZQPR221DS			-	-	-
	ZQPR221GP			-	-	-
	ZQPR222DS			-	-	-
	ZQPR223DS			-	-	-
	ZQPR231/P			-	-	-
	ZQPR232/P			-	-	-
	ZQPR331/P			-	-	-
	ZQPR332/P			-	-	-
Connection terminal type	Stationary type			E·S·C	E·F	E·F
	Plug-in			-	EF·VR	EF·VR
Nechanical life	[Number of operation cycles]			25000	25000	25000
	[number of operation cycles per hour]			240	240	240
Electrical life (415 V AC)	[Number of operation cycles]			8000	8000	8000
	[number of operation cycles per hour]			120	120	120
Basic size	Stationary type	3 pole	W/L [mm]	76	90	105
		4 pole	W/L [mm]	102	120	140
			D [mm]	70	70	70
			H [mm]	130	130	150
Weight	Stationary type	3/4 pole	[kg]	0.9/1.2	1.1/1.5	1.5/2
	Plug-in	3/4 pole	[kg]	-	1.5/1.9	2.7/3.7
	Drawout type	3/4 pole	[kg]	-	-	-

Description of terminal
F = Front terminal

E = Lengthening the front terminal
S = Deploy front terminal

F = Stationary
P = Plug-in type



ZQM3T Plastic housing circuit breaker

List of electrical characteristics

ZQM3T M4	ZQM3T M5	ZQM3T M6	ZQM3T M7
■	■	■	■
-	-	-	-
■ (up to 50A)	-	-	-
■ (up to 250A)	■ (up to 500A)	■ (up to 800A) ¹⁾	-
-	-	-	-
-	■ (up to 500A)	-	-
■	-	-	-
■	■	■	-
-	-	-	-
■	■	■	-
■	■	■	-
-	-	-	■
-	-	-	■
-	-	-	■
-	-	-	■
E·F	E·F	E·F	E·F
EF·VR	EF·VR	-	-
20000	20000	20000	10000
240	120	120	60
8000	7000 (400 A) - 5000 (630 A)	7000 (630 A) - 5000 (800 A) - 4000 (1000 A)	2000(S,H,L) / 3000(V)
120	60	60	60
105	140	210	210
140	186	280	280
103.5	103.5	103.5	154 (manual))/178 (electric)
205	205	268	268
2.35/3.05	3.25/4.15	9.5/12	9.7/12.5 (Manual) -11/14 (Electric)
3.6/4.65	5.15/6.65	-	-
3.85/4.9	5.4/6.9	12.1/15.1	29.7/39.6 (manual) -32/42.6 (electric)

C = Copper cable front terminal

ZQM3T
 Plastic housing circuit breaker

Application scope of circuit breaker in AC and DC systems

	Release	Scope [A]
M1 160	AC	
	TMD	16...160
M2 160	TMD	1.6...160
	TMG	16...160
	MF/MA	1...100
	ZQPR221DS	10...160
	ZQPR221GP	63...160
	ZQPR221MP	40...100
M3 250	TMG	63...250
	TMD	63...250
	MA	100...200
M4 250	TMD	20...50
	TMA	80...250
	MA	10...200
	ZQPR221DS	100...250
	ZQPR222DS/P-ZQPR222DS/PD	100...250
	ZQPR223DS	160...250
M5 400/630	TMG	320...500
	TMA	320...500
	ZQPR221DS	320...630
	ZQPR222DS/P-ZQPR222DS/PD	320...630
	ZQPR223DS	320...630
M6 630/800	TMA	630...800
	ZQPR221DS	630...800
	ZQPR222DS/P-ZQPR222DS/PD	630...800
	ZQPR223DS	630...800
M7 800/1000/ 1250/1600	ZQPR231/P-ZQPR232/P	400...1600
	ZQPR331/P-ZQPR332/P	400...1600
DC		
M1 160	TMD	16...160
M2 160	TMD	1.6...160
	MF/MA	1...100
M3 250	TMD/TMG	63...250
	MA	100...200
M4 250	TMD	20...50
	TMA	80...250
	MA	10...200
M5 400/630	TMA/TMG	320...500
M6 630/800	TMA	630...800

- ◇ MF = Single magnetic release with non-adjustable magnetic threshold.
- ◇ MA = Single magnetic release with adjustable magnetic threshold.
- ◇ TMF = Thermomagnetic release with non-adjustable thermomagnetic threshold.
- ◇ TMD = Thermomagnetic release with adjustable thermomagnetic threshold and non-adjustable thermomagnetic threshold.
- ◇ TMA = Thermomagnetic release with adjustable thermomagnetic threshold.
- ◇ TMG = generator protection type thermo-magnetic release
- ◇ ZQPR22_, ZQPR23_, ZQPR33 = electronic release.

MA							ZQPR221DS-ZQPR222DS/P-ZQPR222DS/PD-ZQPR223DS ¹⁾							ZQPR231/P ³⁾ -ZQPR232/P-ZQPR331/P-ZQPR332/P						
10	25	52	80	100	125	160	200	100	160	250	320	400	630	800	400	630	800	1000	1250	1600
■	■	■	■	■	■	■		■	■	■										
											■	■								
											▲	▲	■							
													■							
													■							
														■						



ZQM3T

Plastic housing circuit breaker

MA						ZQPR221DS-ZQPR222DS/P-ZQPR222DS/PD-ZQPR223DS ^①						ZQPR231/P ^③ -ZQPR232/P-ZQPR331/P-ZQPR332/P					
												▲	▲	■			
												▲	▲	▲	■		
												▲	▲	▲	▲	■	
												▲	▲	▲	▲	▲	■

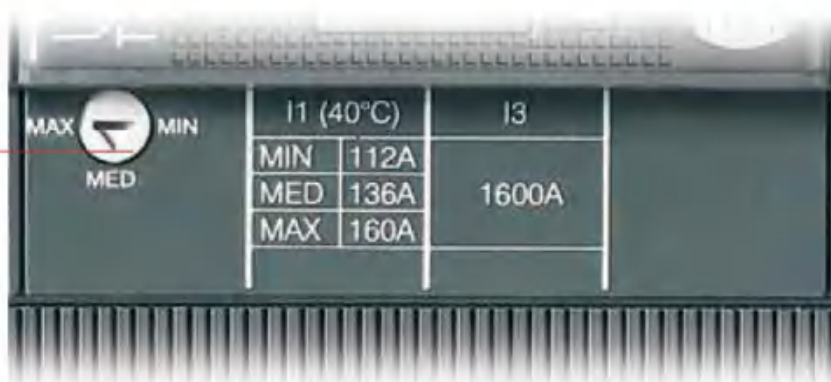
① ZQPR223DS minimum $I_n=160A$.

Thermomagnetic release

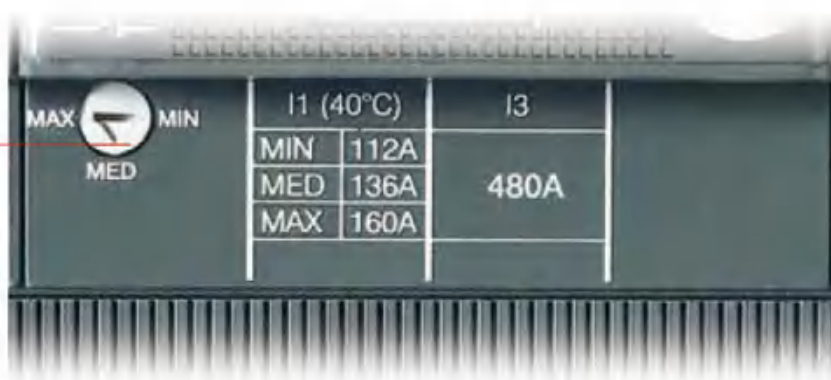
- ◇ M1, M2, M3, M4, M5 and M6 circuit breakers can be equipped with thermal magnetic release, and can be used to protect AC and DC power grids, with a range of 1.6 to 800 A. They can realize overload protection through a thermal release device using bimetallic sheet, and can also realize short-circuit protection through a magnetic release device.
- ◇ The 4-pole circuit breaker is provided with neutral line protection by the release. When the phase current is below 100A, the neutral line protection is set to 100% of the phase current. For circuit breakers with higher phase current, the current of the neutral line is set to 50% of the phase current.
- ◇ In addition, the TMG thermal magnetic release of M2, M3 and M5 has a low magnetic release threshold, which can be used for long cable and generator protection. M2 and M3 are equipped with adjustable thermal release ($I_1=0.7... 1 \times I_n$) and non-adjustable magnetic tripping ($I_3=3 \times I_n$) Thermomagnetic release, T5 with adjustable thermal release ($I_1=0.7... 1 \times I_n$) and adjustable magnetic trip ($I_3=2.5... 5 \times I_n$).

Thermomagnetic release TMD and TMG (applicable to M1, M2 and M3)

Thermal tripping threshold
Can range from 0.7 to $1 \times I_n$ 140R1.



Thermal tripping threshold
Can range from 0.7 to $1 \times I_n$



- ◇ TMD =with adjustable thermal trip threshold ($I_1=0.7... 1 \times I_n$) and non-adjustable magnetic trip threshold ($I_3=10 \times I_n$) thermal magnetic release
- ◇ TMG (for M3)=with adjustable thermal trip threshold ($I_1=0.7... 1 \times I_n$) and non-adjustable magnetic trip threshold ($I_3=3 \times I_n$) Thermomagnetic release for generator protection

ZQM3T

Plastic housing circuit breaker

Overview of features

- ◇ M2, M4, M5, M6 and M7 used in the AC system can be equipped with electronic releases based on micro-processing electronic technology. They can realize reliable protection, accurate release, and are not affected by temperature and electromagnetic elements, and comply with relevant standards.
- ◇ The power supply required for the normal operation of the release can be directly provided by the current sensor. Even under the single-phase load condition and the minimum set value, the normal release of the release can be guaranteed.

Characteristics of electronic release

Working temperature	-25°C ...+70°C
Relative humidity	98%
Self-powered	0.2xIn (single phase)
Auxiliary power supply (on demand)	24VDC
Working frequency	45...66Hz
Electromagnetic compatibility (LF and HF)	IEC60947-2

- ◆ M2, M4, M5 and M6 protection tripping units are composed of the following parts:
 - ◇ 3 or 4 current sensors
 - ◇ Required external current sensor (such as external neutral line transformer)
 - ◇ Tripping unit
 - ◇ Tripping coil (M2: installed in the right slot; M4, M5 and M6: integrated with the electronic tripping unit)
- ◆ The M7 protection tripping unit consists of the following parts:
 - ◇ 3 or 4 current sensors
 - ◇ Required external current sensor
 - ◇ Rated plug-in
 - ◇ Tripping unit
 - ◇ Tripping coil

额定插件

Circuit breaker	Rated current	In [A]					
		400	630	800	1000	1250	1600
M7	800	■	■	■			
	1000	■	■	■	■		
	1250	■	■	■	■	■	
	1600	■	■	■	■	■	■

- ◇ When the protection is tripped, the circuit breaker is opened through the opening coil, and the release is displayed by the change of a transfer contact (AUX-SA, orderable).

Current transformer

	In [A]	10	25	63	100	160	250	320	400	630	800	1000	1250	1600
ZQPR221DS	T2	■	■	■	■	■								
	T4				■	■	■	■						
	T5							■		■				
	T6									■	■			
ZQPR222DS/P, ZQPR222DS/PD	T4				■	■	■	■						
	T5							■		■				
	T6									■	■			
ZQPR231/P, ZQPR232/P, ZQPR331/P, ZQPR332/P	T7								■	■	■	■	■	■

- ◇ For ZQPR223DS, the minimum rated current is In=160A.

ZQM3T Plastic housing circuit breaker

ZQPR221DS

- ◇ ZQPR221DS can be used with M2, M4, M5 and M6 circuit breakers to provide three-stage protection (overload long delay+short circuit short delay+short circuit instantaneous, S mode) and two-stage protection (overload long delay+short circuit instantaneous, I mode). Similarly, release ZQPR221DS-I with only instantaneous short circuit I protection can also be selected
- ◇ When the M2, M4, M5 and M6 electronic release ZQPR221DS-LS/I short circuit protection is set to S mode, the instantaneous protection threshold of the circuit breaker is shown in the following table

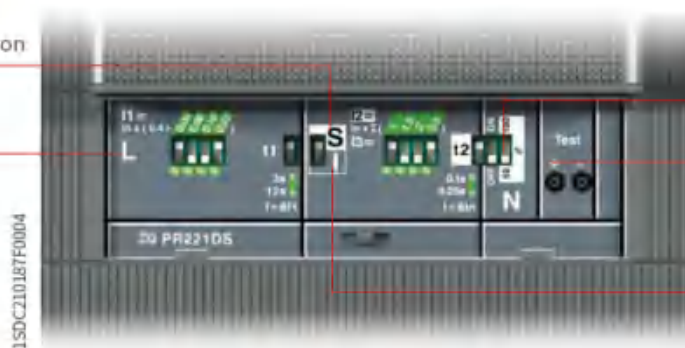
Model	Short circuit protection threshold (A)
M2	160A*12
M4	320A*12
M5 400	400A*12
M5 630	630A*10
M6 800	800A*10

- ◇ The current and protection of the neutral line can be adjusted separately. For M2 (In=100A) circuit breaker, the user can select 50% or 100% of the phase current for the neutral line protection threshold; For M4, M5 and M6, the protection function can be turned off or set to 50% or 100% of the phase current directly through the toggle switch on the front panel of the circuit breaker.

ZQPR221DS-LS/I

S protection
Delay short circuit protection

L protection
overload protection



Neutral line setting toggle switch
(Only applicable to M4, M5, M6)

TM1 test device socket

I protection
Instantaneous short circuit protection

ZQPR221DS-protection functions and parameters

Protection function ¹⁾	Trip threshold	Trip curve ¹⁾	Can be closed	t=f(I)
L Cannot be closed Overload protection tripping characteristic: inverse time long delay (I ₂ t=constant) (IEC 60947-2)	I ₁ = 0.40 - 1×I _n (Step = 0.04×I _n) Trip at 1.1...1.3×I ₁ (M4,M5,M6) Trip at 1.05...1.3×I ₁ (M2).	At 6×I ₁ T ₁ = 3-6s (only for M2)-12S (only for M4,M5,M6) Allowable deviation: ± 10% to 6×I _n (M4,M5,M6), ± 10% to 2×I _n (M2), ± 20% 6×I _n Above I _n (M4,M5,M6), ± 20% 2×I _n Above I _n (M2)	-	t = k / I ₂
S Can be closed Inverse-time short time delay and tripping curve of delayed short circuit protection (I ₂ t=constant) (S protection mode)	I ₂ = 1 - 1.5 - 2 - 2.5 - 3 - 3.5 - 4.5 - 5.5 - 6.5 - 7 - 7.5 - 8 - 8.5 - 9 - 10×I _n Allowable deviation: ± 10% (M4, M5, M6), ± 10% to 2×I _n (M2), ± 20% 2×I _n above (M2)	At 8×I _n t ₂ = 0.1 - 0.25s Allowable deviation: ± 10% to 6×I _n (M4,M5,M6), ± 20% 6×I _n Above I _n (M4,M5,M6), ± 20% (M2)	■	t = k / I ₂
I Can be closed Instantaneous short circuit protection (I protection mode)	I ₃ = 1 - 1.5 - 2 - 2.5 - 3 - 3.5 - 4.5 - 5.5 - 6.5 - 7 - 7.5 - 8 - 8.5 - 9 - 10×I _n Allowable deviation: 10% (M4,M5, M6), ± 20% (M2)	instant	■	t = k

◆ These allowable deviations are suitable for the following conditions:

- ◇ Release self-powered or auxiliary power supply
- ◇ 2 or 3 phase power supply

◆ In addition to those considered tolerances, the following deviations should also be considered:

	Trip threshold	Tripping time
S	± 20%	± 20%
I	± 20%	≤ 40ms

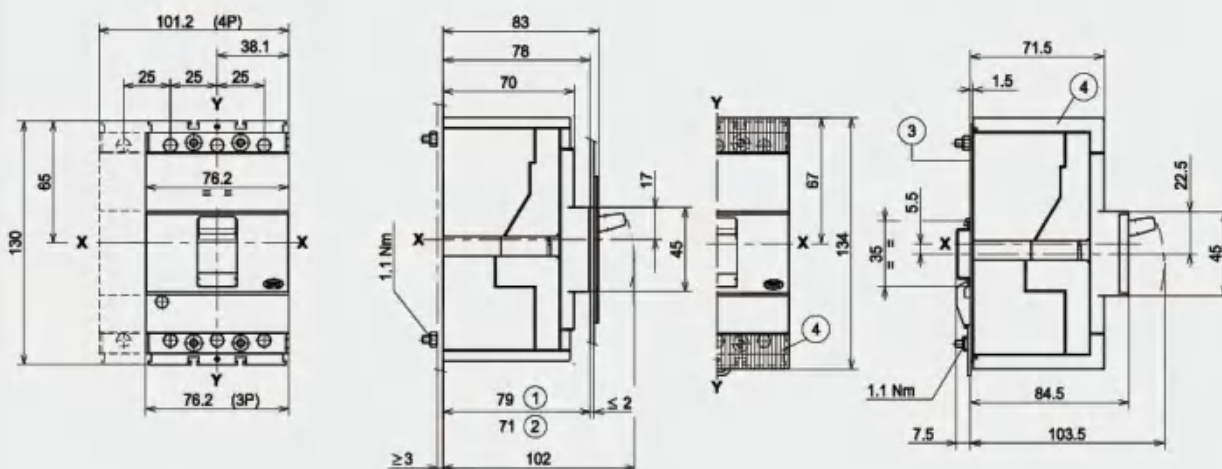
ZQM3T

Plastic housing circuit breaker

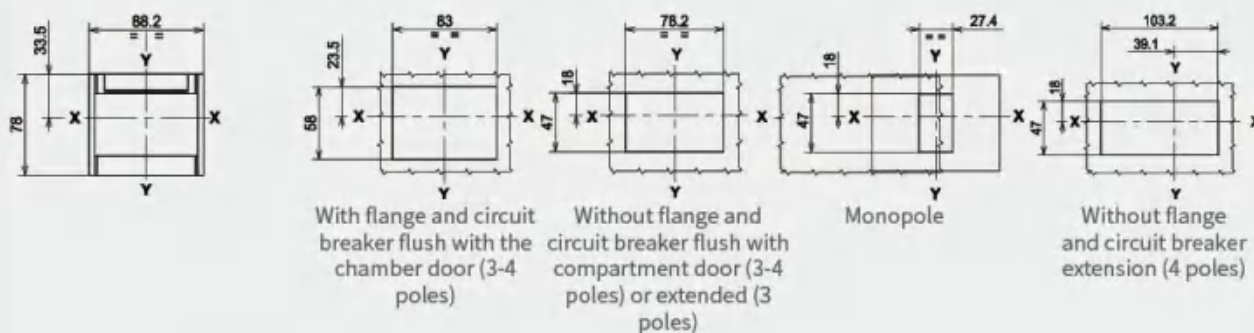
Overall dimension (mm)

Fixed circuit breaker

Mounted on the guide rail

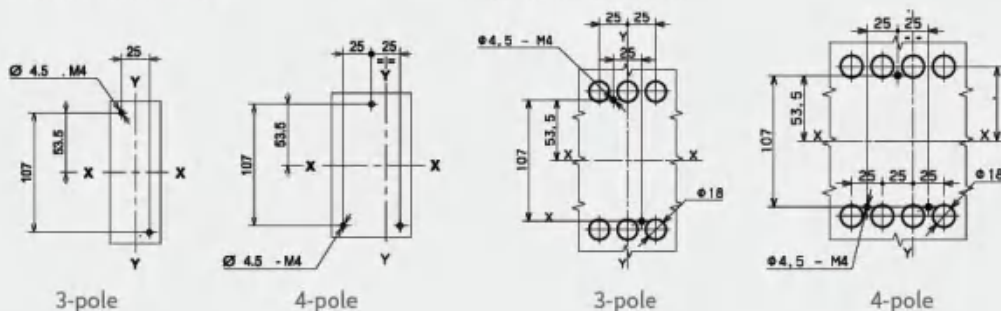


Chamber door drilling drawing



Front terminal block-F

Rear terminal block-R



ZQM3T Plastic housing circuit breaker

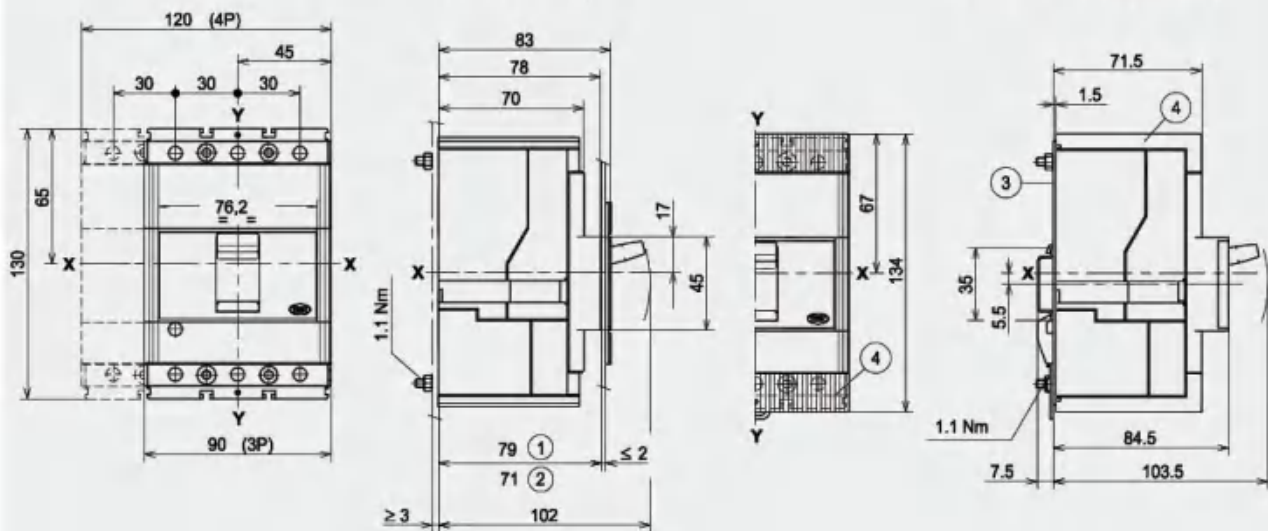
Overall dimension (mm)

ZQM3TxM2-stationary

Fixed circuit breaker

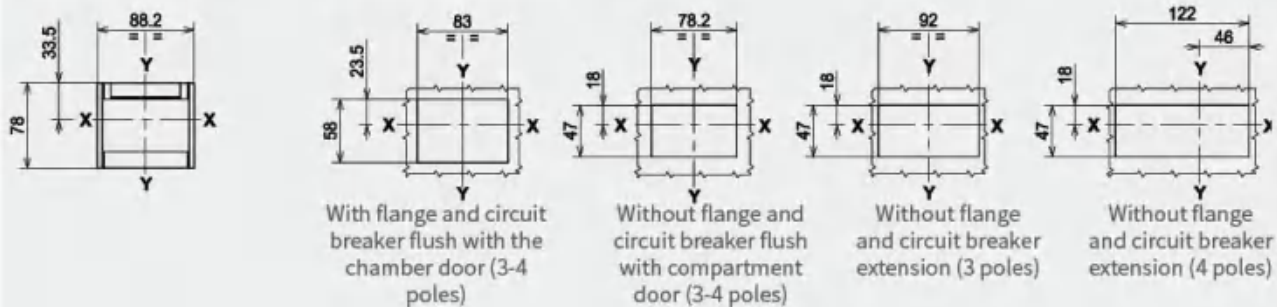
Mounted on steel plate

Mounted on the guide rail



Chamber door flange

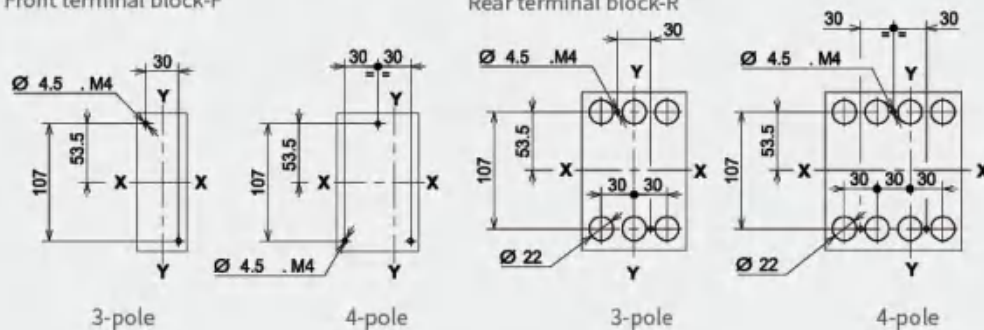
Chamber door drilling drawing



Drilling drawing of support steel plate

Front terminal block-F

Rear terminal block-R



ZQM3T Plastic housing circuit breaker

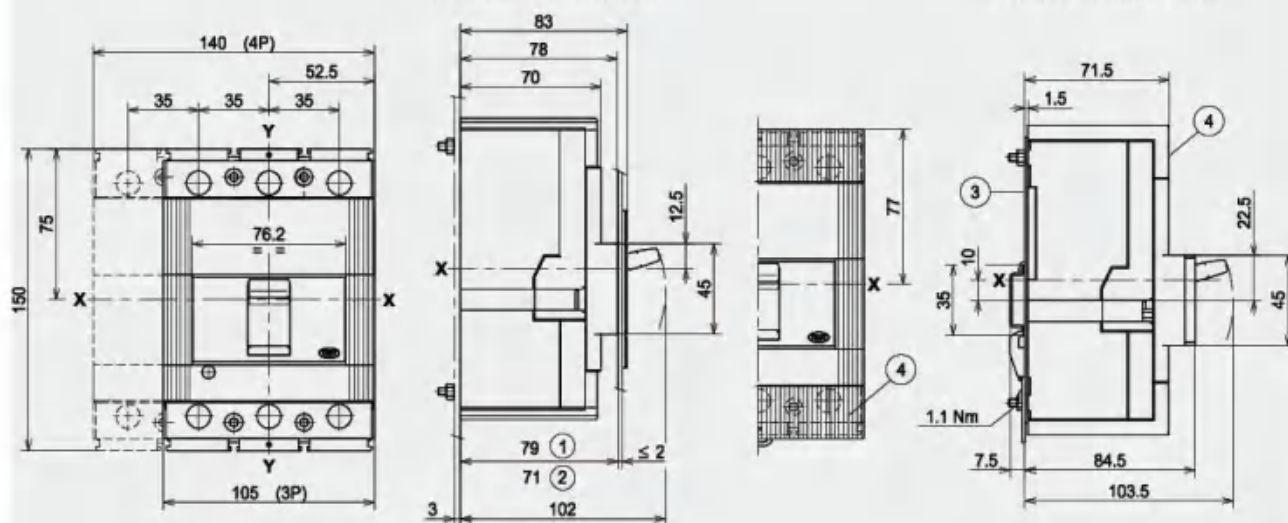
Overall dimension (mm)

ZQM3TxM3-stationary

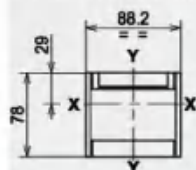
Fixed circuit breaker

Mounted on steel plate

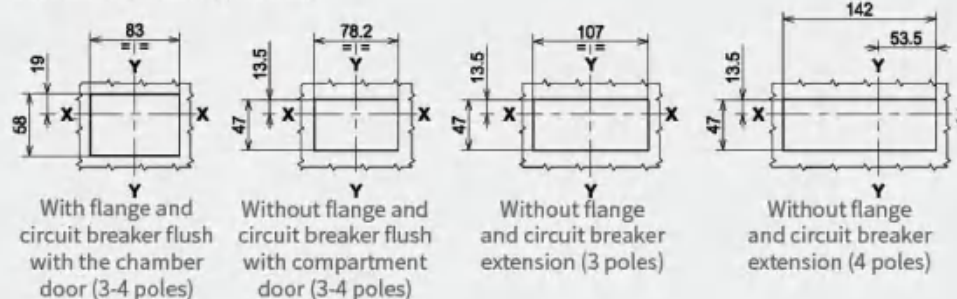
Mounted on the guide rail



Chamber door flange

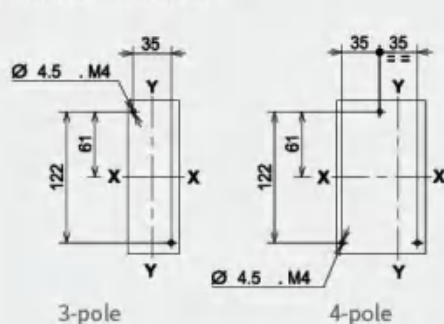


Chamber door drilling drawing

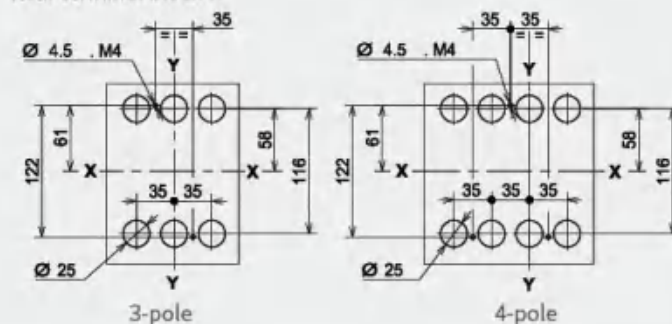


Drilling drawing of support steel plate

Front terminal block-F



Rear terminal block-R





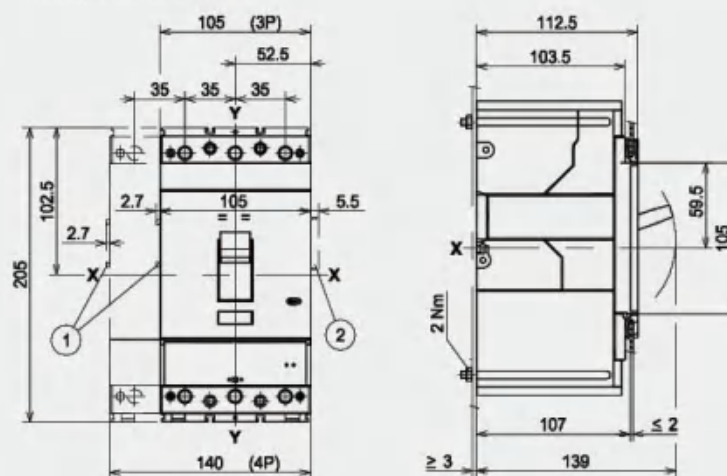
ZQM3T Plastic housing circuit breaker

Overall dimension (mm)

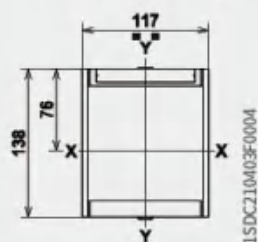
ZQM3TxM4-stationary

Fixed circuit breaker

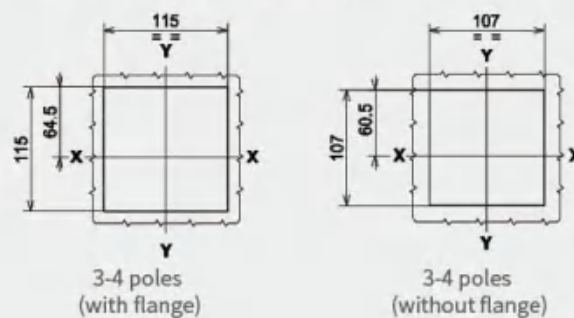
Mounted on steel plate



Chamber door flange

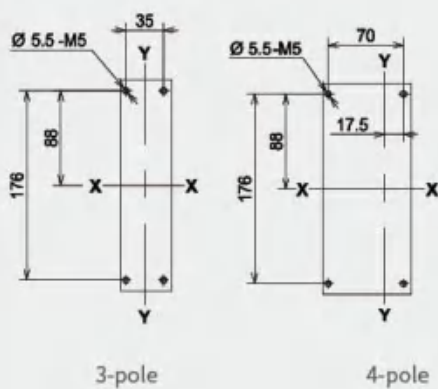


Chamber door drilling drawing

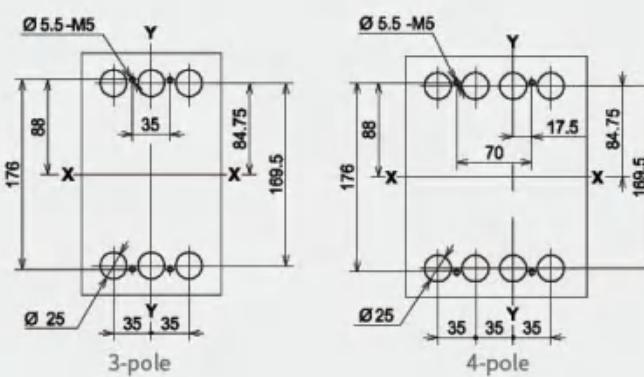


Drilling drawing of support steel plate

Front terminal block-F



Rear terminal block-R





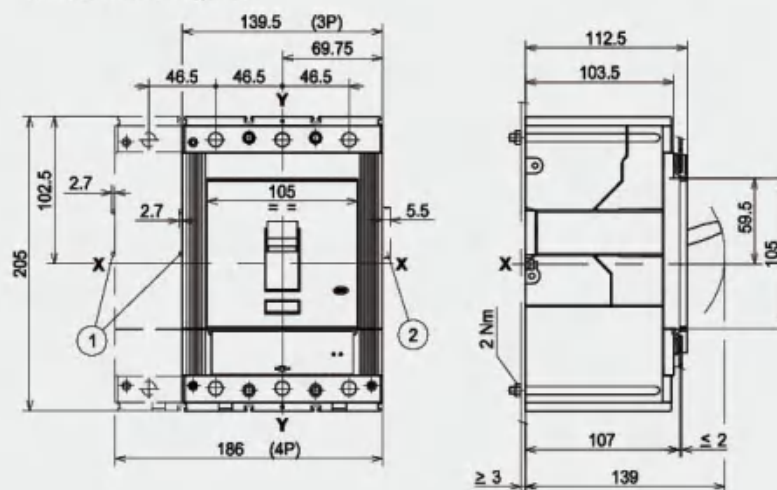
ZQM3T Plastic housing circuit breaker

Overall dimension (mm)

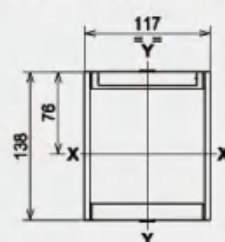
ZQM3TxM5-stationary

Fixed circuit breaker

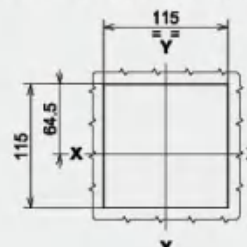
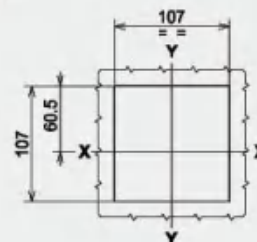
Mounted on steel plate



Chamber door flange

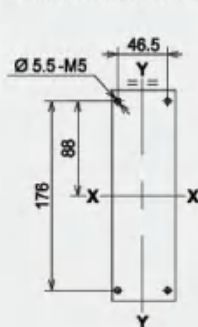


Chamber door drilling drawing

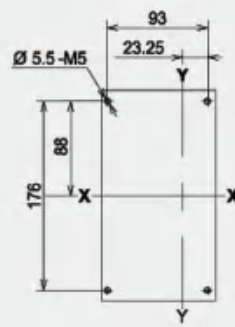
3-4 poles
(with flange)3-4 poles
(without flange)

Drilling drawing of support steel plate

Front terminal block-F

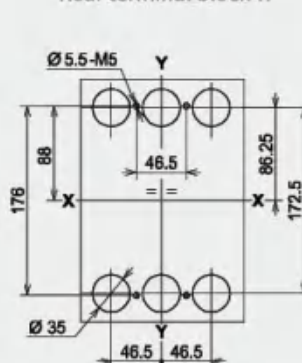


3-pole

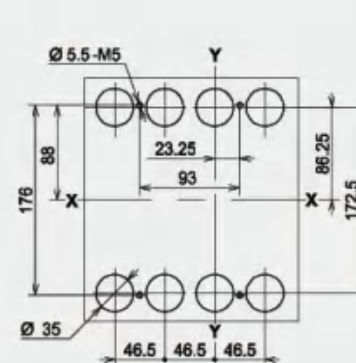


4-pole

Rear terminal block-R



3-pole



4-pole



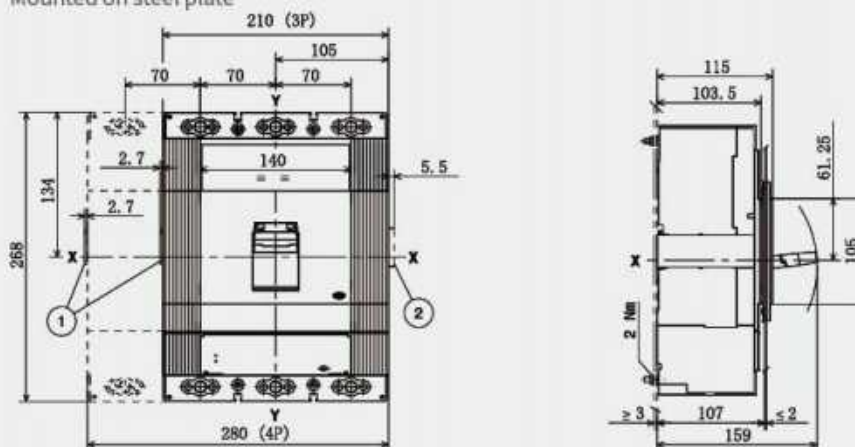
ZQM3T Plastic housing circuit breaker

Overall dimension (mm)

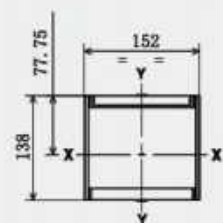
ZQM3TxM6-stationary

Fixed circuit breaker

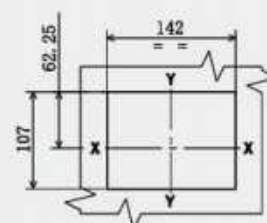
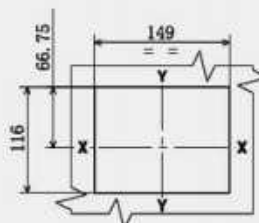
Mounted on steel plate



Chamber door flange

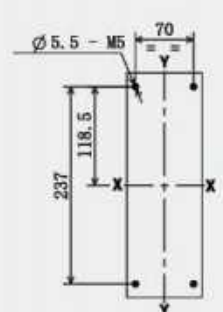


Chamber door drilling drawing

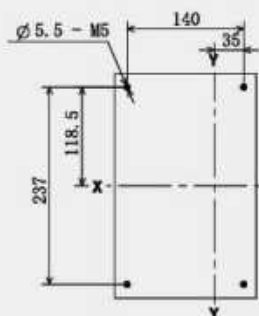


Drilling drawing of support steel plate

Front terminal block F, EF, ES, FC Cu, FC CuAl



3-pole



4-pole

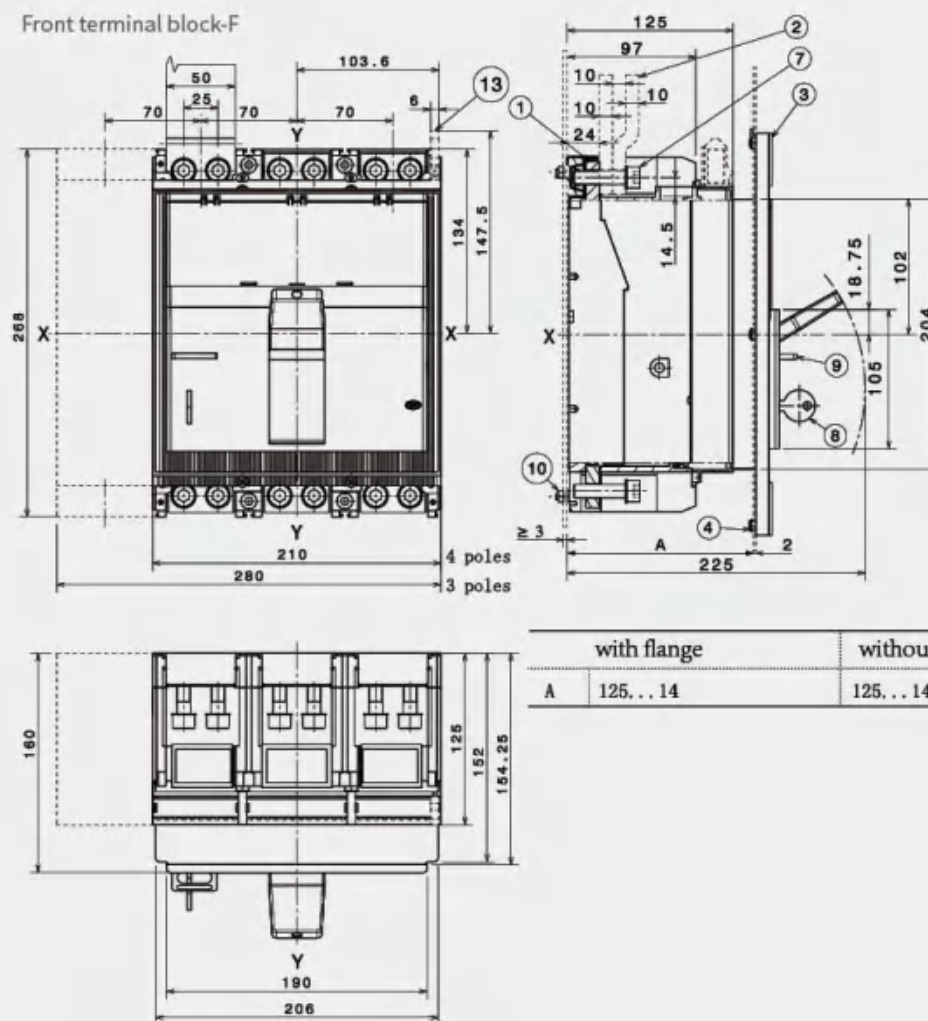
ZQM3T Plastic housing circuit breaker

Overall dimension (mm)

ZQM3TxM7-stationary

Fixed circuit breaker

Front terminal block-F



Note:

- ① Front terminal block
- ② Busbar
- ③ chamber door flange
- ④ Flange fixing screw
- ⑤ Drilling drawing of support steel plate
- ⑥ Torque: 18Nm
- ⑦ Key lock
- ⑧ Padlock (optional)
- ⑨ Torque: 2.5Nm
- ⑩ Chamber door drilling drawing (with flange)
- ⑪ Chamber door drilling drawing (without flange) 206x204
- ⑫ Terminal
- ⑬ Reduced chamber door flange
- ⑭ Chamber door drilling drawing (with reduced flange)
- ⑮ Chamber door drilling drawing (without rotary handle) 190x105

ZQM3T Plastic housing circuit breaker

Terminal block

- ◇ The standard configuration terminal of molded case circuit breaker is as follows: M1 is the front terminal of copper cable (FC Cu); M2, M3, M4, M5 and M6 are front terminals (F)
- ◇ Users can choose different types of terminals according to their needs, and can make different combinations (one type for the upper terminal and one type for the lower terminal).
- ◇ In the product manual, the connection information of various terminal blocks is listed in detail, such as the torque value of the connecting bolts of the cable or busbar, and the maximum or minimum interface size of the bare conductor connecting cable
- ◇ Please read the product manual carefully and follow the torque requirements; In addition, all extended front terminal blocks (E) and extended front terminal blocks (F) are equipped with interphase partitions as standard. Pay attention to the product insulation requirements when using, and correctly use interphase partitions according to the product instructions



Extend front wiring terminal⁽¹⁾⁽²⁾⁽³⁾-E

	6 pieces model	8 pieces model
M1 extension front terminal E	E6/M1	E8/M1
M2 extension front terminal E	E6/M2	E8/M2
M3 extension front terminal E	E6/M3	E8/M3
M4 extension front terminal E	E6/M4	E8/M4
M5 extension front terminal E	E6/M5	E8/M5
M6 630 extension front terminal E	E6/M6 630	E8/M6 630
M6 800 extension front terminal E	E6/M6 800	E8/M6 800
M7-M7M extension front terminal E	E6/M7	E8/M7

Extended front terminal block^{*(1)(4)(5)}-F

M2 extended front terminal F	F6/M2	F8/M2
M3 extended front terminal F	F6/M3	F8/M3
M4 extended front terminal F	F6/M4*	F8/M4
M5 extended front terminal F	F6/M5*	F8/M5
M6 extended front terminal F	F6/M6	F8/M6
M7-M7M Extended Front Terminal F	F6/M7	F8/M7

Copper cable front terminal⁽⁶⁾⁽⁷⁾⁽⁸⁾-F·C

M2 copper cable front terminal F.C	F·C6/M2	F·C8/M2
M3 copper cable front terminal F.C	F·C6/M3	F·C8/M3
M5 400 copper cable front terminal F.C	F·C6/M5 400	F·C8/M5 400
M5 630 copper cable front terminal F.C	F·C6/M5 630	F·C8/M5 630

Note:

- ◇ All extension front terminals are equipped with interphase partition as standard
- ◇ The dimension of the standard interphase partition for M1, M2 and M3 extended front terminal blocks is about 102.2 * 68 (mm)
- ◇ The dimension of the standard interphase partition for M4 and M5 lengthened front terminal blocks is about 102.2 * 100 (mm)
- ◇ The dimension of the standard interphase partition for M2 and M3 extended terminal blocks is about 202.2 * 100 (mm)
- ◇ The dimension of the standard interphase partition for M4 and M5 extended terminal blocks is about 202.2 * 100 (mm)
- ◇ The bare copper cable can be directly connected to the circuit breaker.
- ◇ The requirements for connecting cables, such as cross-sectional area, are listed in the product manual.
- ◇ See the product manual for the torque value of the connecting cable.

ZQM3T Plastic housing circuit breaker



Shunt release -MX

- ◇ The shunt release can enable the circuit breaker to execute the electrical disconnection command
- ◇ When the voltage is 70%-110% (AC/DC) of the rated voltage U_n of the shunt release, the trip will act.
- ◇ The shunt release of M1/M2/M3 pre-connected wire becomes the corresponding shunt release without wire after releasing the matched wire of the release
- ◇ The structure of the M4/M5/M6 pre-wired shunt release is different from that of the corresponding shunt release without wire
- ◇ Generally, the shunt release is installed in the left slot of the circuit breaker; For M4/M5 4P circuit breaker, it is installed in the second slot on the left

	model
M1-M3 shunt release MX 12Vdc	MX-12/M1-3
M1-M3 shunt release MX 24-30Vac/dc	MX-24/M1-3
M1-M3 shunt release MX 220-240Vac/220-250Vdc	MX-220/M1-3
M1-M3 shunt release MX 380-440Vac	MX-380/M1-3
M1-M3 shunt release MX 110-127Vac/110-125Vdc	MX-110/M1-3
M1-M3 shunt release MX 12Vdc	MX-48/M1-3
M4-M6 shunt release MX 24-30Vac/dc	MX-24/M4-6
M4-M6 shunt release MX 110-127Vac/110-125Vdc	MX-110/M4-6
M4-M6 shunt release MX 220-240Vac/220-250Vdc	MX-220/M4-6
M4-M6 shunt release MX 380-440Vac	MX-380/M4-6
M4-M6 shunt release MX 12Vdc	MX-12/M4-6
M4-M6 shunt release MX 48-60Vac/dc	MX-48M4-6
M4-M6 shunt release MX 480-525Vac	MX-480/M4-6

Note: M4-M6 plug-in type, draw-out type or circuit breaker equipped with electric operating mechanism must select the under-voltage release or shunt release with wire form; At the same time, the adapter needs to be ordered

辅助触头 -OF·SD

- ◇ The function of the electrical signal of the auxiliary contact: display the information related to the working state of the circuit breaker externally.
- ◇ During installation, the circuit breaker shall be installed directly from the front in the right slot of the circuit breaker
- ◇ Auxiliary contacts are divided into pre-wired type and non-wired type.
- ◇ Zhong qiao can provide the connecting wire of auxiliary contact: 6 Cables, 12 Cables



预接导线

	model
M1-M3 auxiliary contact OF 1Q+1SY 250V AC/DC	1Q1SY-C 250/M1-3
M1-M3 auxiliary contact OF 3Q+1SY 250V AC/DC	3Q1SY-C 250/M1-3
M1-M3 auxiliary contact OF 3Q+1SY 24V DC	3Q1SY-C 24/M1-3
M4-M6 auxiliary contact OF 1Q+1SY 250V AC/DC	1Q1SY-C 250/M4-6
M4-M6 auxiliary contact OF 3Q+1SY 250V AC/DC	3Q1SY-C 250/M4-6
M4-M6 auxiliary contact OF 1Q+1SY 400V AC	1Q1SY-C 400/M4-6
M4-M6 auxiliary contact OF 2Q 400V AC	2Q-C 400/M4-6
M4-M6 auxiliary contact OF 3Q+1SY 24V DC	3Q1SY-C 24/M4-6
M2 ZQPR221 auxiliary contact of 1s51qsy ⁽¹⁾	1S511QSY-C ZQPR221DS/M2
M2 ZQPR221 auxiliary contact OF 2Q+1SY ⁽²⁾	2Q1SY-C ZQPR221DS/M2

Contact model description:

Q (close/open)-indicates the position of the circuit breaker contact.

SY (Tripper Trip)-Electrical signal indicating the circuit breaker trip caused by electronic tripper ZQPR/RC/YO/YU/MOS/Trip.

S51 (tripping signal contact of electronic release)-the tripping signal caused by any protective action of electronic release.

(1) The auxiliary contact is the special auxiliary contact for M2 circuit breaker with ZQPR221 release, which is applicable to both 3P and 4P



ZQM3T Plastic housing circuit breaker

Undervoltage release -MN



- ◇ When the supply voltage of the undervoltage release drops to $(0.7-0.35) U_n$ of its rated value, the undervoltage release will open the circuit breaker
- ◇ When the undervoltage release is not energized, the circuit breaker or main contact cannot be closed.
- ◇ The under-voltage release of M1/M2/M3 pre-connected wire becomes the corresponding under-voltage release without wire after loosening the supporting wire of the release
- ◇ The structure of the undervoltage release of M4/M5/M6 pre-connected conductor is different from that of the corresponding undervoltage release without conductor.
- ◇ Generally, the undervoltage release is installed in the left slot of the circuit breaker; For M4/M5 4P circuit breaker, it is installed in the second slot on the left.

	model
M1-M3 undervoltage release MN 24-30Vac/dc	MN 24/M1-3
M1-M3 undervoltage release MN 48Vac/dc	MN 48/M1-3
M1-M3 undervoltage release MN 60Vac/dc	MN 60/M1-3
M1-M3 undervoltage release MN 110-127Vac/110-125Vdc	MN 110/M1-3
M1-M3 undervoltage release MN 220-240Vac/220-250Vdc	MN 220/M1-3
M1-M3 undervoltage release MN 380-440Vac	MN 380/M1-3
M1-M3 undervoltage release MN 480-525Vac	MN 480/M1-3
M4-M6 undervoltage release MN 24-30Vac/dc	MN 24/M1-6
M4-M6 undervoltage release MN 48Vac/dc	MN 48/M1-6
M4-M6 undervoltage release MN 60Vac/dc	MN 60/M1-6
M4-M6 undervoltage release MN 110-127Vac/110-125Vdc	MN 110/M1-6
M4-M6 undervoltage release MN 220-240Vac/220-250Vdc	MN 220/M1-6
M4-M6 undervoltage release MN 380-440Vac	MN 380/M1-6
M4-M6 undervoltage release MN 480-525Vac	MN 480/M1-6
M7-M7M undervoltage release MN 24Vac/dc	MN 24/M7
M7-M7M undervoltage release MN 30Vac/dc	MN 30/M7
M7-M7M undervoltage release MN 48Vac/dc	MN 48/M7
M7-M7M undervoltage release MN 60Vac/dc	MN 60/M7
M7-M7M undervoltage release MN 110-120Vac/dc	MN 110/M7
M7-M7M undervoltage release MN 120-127Vac/dc	MN 120/M7
M7-M7M undervoltage release MN 220-240Vac/dc	MN 220/M7
M7-M7M undervoltage release MN 240-250Vac/dc	MN 240/M7
M7-M7M undervoltage release MN 380-400Vac	MN 380/M7
M7-M7M undervoltage release MN 415-400Vac	MN 415/M7

Note:

- ◇ The under-voltage release of M1/M2/M3 pre-connected wire becomes the corresponding under-voltage release without wire after loosening the supporting wire of the release.
- ◇ M4/M5/M6 undervoltage release without conductor is an imported product. Please contact Zhong qiao to confirm the delivery date before ordering.



ZQM3T Plastic housing circuit breaker



Rotary handle

- ◇ The rotary handle is mainly divided into two types: direct action type (RHD) and adjustable extension type (RHE).
- ◇ The three components constituting the adjustable extension type can be ordered separately: the cab door rotary handle (RHE_H), the extension rod (RHE_S), and the mechanism base (RHE_B) installed on the circuit breaker.
- ◇ The emergency rotary handle is a yellow-red handle and yellow panel, which is mostly used for machine tool control.
- ◇ In addition, Zhong qiao provide padlocks for opening position: RHL for M1/M2/M3 and KLF for M4/M5/M6.

Straight rotary handle-RHD

	model
M1-M3 straight rotary handle RHD	RHD F-P/M1-3
M4-M5 straight rotary handle RHD	RHD F-P/M4-5
M4-M5 straight rotary handle RHD	RHD W/M4-5
M6 straight rotary handle RHD	RHD F-P/M6
M6 straight rotary handle RHD	RHD W/M6
M7 straight rotary handle RHD	RHD F-P/M7(ml)
M7 straight rotary handle RHD	RHD W/M7(ml)

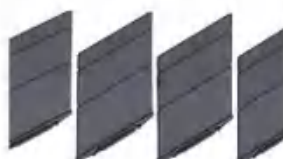


Adjustable extended rotary handle - RHE

	model
M1-M3 adjustable extended rotary handle RHE F-P	RHE F-P/M1-3
M4-M5 adjustable extended rotary handle RHE F-P	RHE F-P/M4-5
M4-M5 adjustable extended rotary handle RHE W	RHE W/M4-5
M6 adjustable extended rotary handle RHE F-P	RHE F-P/M6
M6 adjustable extended rotary handle RHE W	RHE W/M6
M7 adjustable extended rotary handle RHE F-P	RHE F-P/M7(ml)
M7 adjustable extended rotary handle RHE W	RHE W/M7(ml)

Interphase partition

- ◇ The part number of M4 and M5 circuit breakers with standard interphase partition is RA1752/002, and the size is about 100 × 26.4 (long × Wide)
- ◇ The dimension of the standard interphase partition for M1, M2 and M3 extended front terminal blocks is about 102.2 * 68 (mm).
The standard dimension of interphase separator for M4 and M5 extended front terminal is about 102.2*100(mm).
- ◇ M2, M3 extended extension terminal comes standard with an external dimension of about 202.2*100(mm).
- ◇ The dimension of the standard interphase partition for M4 and M5 extended terminal blocks is about 202.2 * 100 (mm).
- ◇ M5 630 plug-in/draw-out extended front wiring fixed part is equipped with interphase partition as standard, and its overall dimension is about 202.2 × 100(mm).





ZQM3T

Plastic housing circuit breaker

	4 pole	3 pole
	model	model
M1-M3 interphase partition PB100	PB100 3×4/M1-3	PB100 4×6/M1-3
M1-M3 interphase partition PB200	PB200 3×4/M1-3	PB200 4×6/M1-3
M4-M5 interphase partition PB100	PB100 3×4/M4-5	PB100 4×6/M4-5
M4-M5 interphase partition PB200	PB200 3×4/M4-5	PB200 4×6/M4-5
M6 interphase partition PB100	PB100 3×4/M6	PB100 4×6/M6
M7-M7M interphase partition PB100	PB100 3×4/M7	PB100 4×6/M7
M7-M7M interphase partition PB200	PB200 3×4/M7	PB200 4×6/M7

Plug-in fixed part

◇ The plug-in ZQM3T is composed of the body, the conversion part and the plug-in fixed part. The body and the conversion part can be ordered separately or integrally, while the fixed part needs to be ordered separately

◇ M2/M3/M4/M5 can choose plug-in connection mode.



Front/rear wiring-F/R

	3- pole
	model
M2 plug-in front wiring fixed part PFP F ⁽¹⁾	PFP F3/M2
M3 plug-in front wiring fixed part PFP F ⁽¹⁾	PFP F3/M3
M2 plug-in front wiring fixed part PFP R ⁽¹⁾	PFP R3/M2
M3 Plug-in Front Wiring Fixed Part PFP R ⁽¹⁾	PFP F3/M3

Extended front wiring-EF

M4 plug-in extended front wiring fixed part PFP EF	PFP EF3/M4
M5 400 Plug-in extended Front Wiring fixed part PFP EF	PFP EF3/M5 400
M5 630 Plug-in extended Front wiring fixed part PFP EF ⁽⁴⁾	PFP EF3/M5 630

Rear horizontal wiring-HR

M4 plug-in rear horizontal wiring fixed part PFP HR	PFP HR3/M4
M5 400 Plug-in rear horizontal wiring fixed part PFP HR	PFP HR3/M5 400
M5 630 Plug-in rear horizontal wiring fixed part PFP HR ⁽⁴⁾	PFP HR3/M5 630





Striving for perfection is the driving force that we have been insisting on. Grasp every detail to make the product more perfect.



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- Intelligent universal circuit breaker
- Molded case circuit breaker
- Intelligent molded case circuit breaker**
- Leakage molded case circuit breaker
- Miniature circuit breaker
- Self-resetting overvoltage and undervoltage
- dual power switch
- Load disconnecter
- Contactors thermal relay
- Branch/busbar

ZQM1E

Intelligent Moulded Case Circuit Breaker



ZQM1E Intelligent Moulded Case Circuit Breaker



Product overview

- ◇ ZQM1E series intelligent plastic case circuit breaker is one of the new circuit breakers designed, developed and manufactured by our company with international advanced technology. The rated isolation voltage is 800V, which is suitable for infrequent switching and infrequent starting of motors in circuits with AC 50Hz, rated working voltage of 400V and rated working current of 800A.
- ◇ The circuit breaker has the functions of overload long time-delay inverse time, short circuit short time-delay inverse time, short circuit short time-delay definite time, short circuit instantaneous and undervoltage protection, which can protect lines and power equipment from damage. The product has complete accessories.
- ◇ Conforming standards: IEC60947-2, GB/T 14048.2.

Model meaning

ZQ M 1 E - 125M ZA / 3 300 2 B 100A

- Operating current (optional)
- Optional code of quadrupole product (A, B, C, D)
- Optional code for different purposes (2, "or no code")
- Internal accessory code of tripping mode
- Optional code of pole number (3, 4)
- Code of external accessories (P: electric operation, ZA round handle operation, ZF square handle manual operation)
- Breaking capacity (M, H)
- Shell frame grade (125, 250, 400, 630, 800)
- Intelligent code (E: electronic controller)
- Design serial number
- Product model
- Name of the company

Note

- ◇ According to the shell frame grade current: $I_{nm}=125$, $I_{nm}=250$, $I_{nm}=400$, $I_{nm}=630$, $I_{nm}=800$;
- ◇ According to the rated breaking capacity: C basic type (25kA), L standard type (35kA), M high breaking type (65kA) and H high breaking type (100kA);
- ◇ According to the operation mode: there is no code for direct operation of the handle; P means electric operation; Z means rotary handle operation;
- ◇ Rated current optional:
ZQM1E-125 is 16, 20, 25, 32, 40, 50, 63, 80, 100, 125 ;
ZQM1E-250 is 100, 125, 140, 160, 180, 200, 225, 250 ;
ZQM1E-400 is 200, 225, 250, 315, 350, 400 ;
ZQM1E-630 is 250, 315, 350, 400, 500, 630 ;
ZQM1E-800 is 500, 630, 700, 800 ;
- ◇ Optional codes according to the number of poles: 2 represents two poles, 3 represents three poles and 4 represents four poles.
- ◇ Optional codes for tripping mode and internal accessories: the first digit represents the tripping mode, the last two digits represent the internal accessories code, 2 represents electromagnetic tripping (instantaneous), and 3 represents multiple tripping (thermal+electromagnetic);
- ◇ Optional codes for different purposes: no code for power distribution, 2 for motor protection;
- ◇ Optional code of quadrupole products:
Type A: the N-pole is not equipped with overcurrent tripping element, and the N-pole is always connected, and it is not closed or opened with other three poles;
Type B: the N-pole is not equipped with overcurrent tripping element, and the N-pole is opened and closed with other three poles;
Type C: the N-pole is equipped with overcurrent tripping element, and the N-pole is opened and closed with other three poles;
Type D: the N-pole is equipped with overcurrent tripping element, and the N-pole is always connected, and it is not opened or closed with other three poles.
- ◇ According to the wiring mode, it can be divided into front panel wiring, rear panel wiring, plug-in rear panel wiring and plug-in front panel wiring.
- ◇ Other accessories are mechanical interlocking (mechanical interlocking between two circuit breakers).



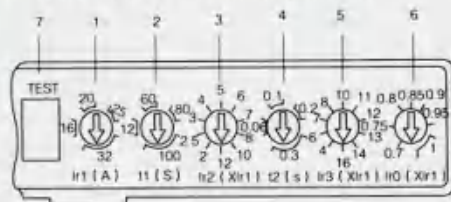
ZQM1E Intelligent Moulded Case Circuit Breaker

Main performance characteristics

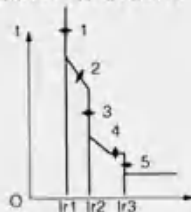
- ◇ ZQM1E series intelligent plastic case circuit breakers have three-section protection functions and the circuit breaker with category B is fully selectively with other circuit breakers protection devices connected in the same circuit under short circuit conditions;
- ◇ There are five tripping characteristics : users can set and adjust the release according to the load current requirements;
- ◇ The electronic release is powered by the circuit breaker itself, and the current signal and control power are from the ring current transformer installed in the circuit breaker;
- ◇ With early warning indication: when the load current exceeds the preset current, the LED on the breaker cover indicates yellow;
- ◇ Overload indication: When the load current exceeds the setting current, the LED on the breaker cover indicates red;
- ◇ It has the function of overload non tripping only alarm for fire protection. When the load current is overloaded, the circuit breaker will not trip, and a passive contact signal will be output to drive the corresponding alarm device;
- ◇ Meet the electromagnetic compatibility requirements of IEC60947 Appendix F;
- ◇ The overall dimensions are the same as those of ZQM1 series molded case circuit breakers, and the installation is interchangeable.

Introduction to structure identification

◇ ZQM1E-125, $I_n=32A$ intelligent release



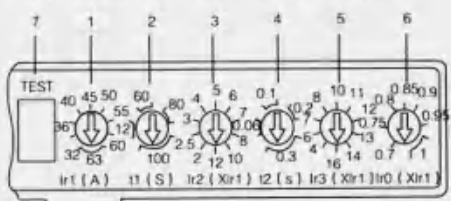
Intelligent release protection characteristic curve



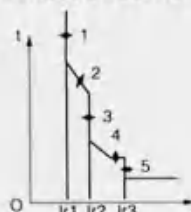
Protection:

1. The overload long delay action current I_{r1} can be adjusted from 4 points to 10 points according to different rated current of the circuit breaker;
2. The long delay action time t_1 can be adjusted at 4 points;
3. The short-circuit short-delay action current I_{r2} can be adjusted at 10 points;
4. The short delay action time t_2 can be adjusted at 4 points;
5. The short-circuit instantaneous action current I_{r3} can be adjusted at 9 or 10 points.
6. The I_{r0} adjustment of the prealarm action current can be adjusted at 7 points;
7. The test terminal is used to detect the current setting value of the electronic release;
8. Working indication of electronic release;
9. Pre-alarm indication;
10. Overload indication;
11. Trip button.

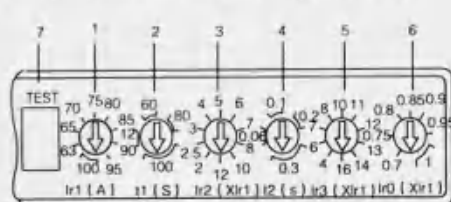
◇ ZQM1E-125, $I_n=63A$ intelligent release



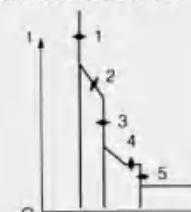
Intelligent release protection characteristic curve



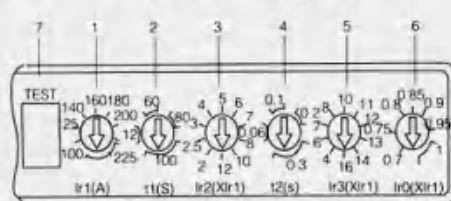
◇ ZQM1E-125, $I_n=125A$ intelligent release



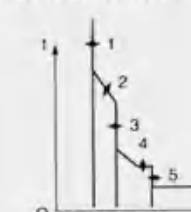
Intelligent release protection characteristic curve



◇ ZQM1E-250, $I_n=250A$ intelligent release



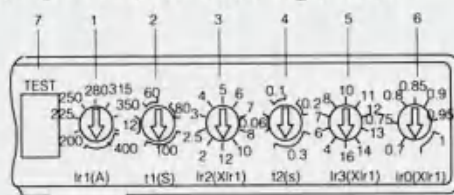
Intelligent release protection characteristic curve



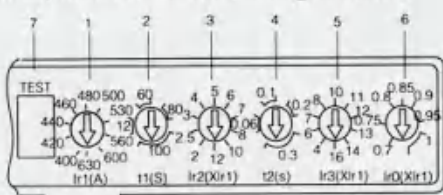
ZQM1E Intelligent Moulded Case Circuit Breaker

Introduction to structure identification

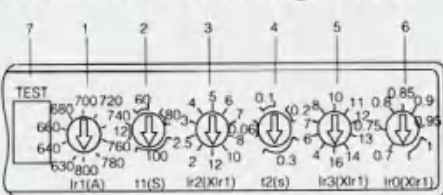
◇ ZQM1E-400, In=400A intelligent release



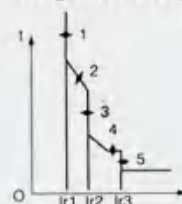
◇ ZQM1E-630, In=630A intelligent release



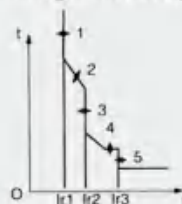
◇ ZQM1E-800, In=800A intelligent release



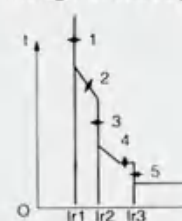
Intelligent release protection characteristic curve



Intelligent release protection characteristic curve



Intelligent release protection characteristic curve



Main technical performance indicators

Model		ZQM1E-125		ZQM1E-250		ZQM1E-400		ZQM1E-630		ZQM1E-800	
Shell frame current Inm(A)		125		250		400		630		800	
Rated current Ir1(A)		32(16/20/25/32) 63(32/40/50/63) 125(63/70/80/100/125)		250(125/125/140/ 160/180/200/225/ 250)		400(225/250/280/ 315/350/400)		630(400/440/460/ 560/600/630)		800(630/660/700/ 740/780/800)	
Number of poles		3		3		3		3		3	
		4		4		4		4		4	
Rated insulation voltageUi(V)		AC800									
Rated working voltage Ue(V)		AC400									
Rated working frequency (AC)		50/60Hz		50/60Hz		50/60Hz		50/60Hz		50/60Hz	
Rated impulse withstand voltage Uimp (V)		8000									
		M	H	M	H	M	H	M	H	M	H
Ultimate short circuit breaking capacity Icu (kA)	AC400V	50	85	50	85	65	85	65	85	75	125
Operating short circuit breaking capability Ics(kA)	AC400V	35	50	35	50	42	50	42	50	50	65
Operating short-time withstand current Icw(In)/1s		15									
Use category		A		A		B		B		B	
Operational performance	Power on (times)	1500		1000		1000		1000		500	
	No power(times)	8500		7000		4000		4000		2500	

ZQM1E Intelligent Moulded Case Circuit Breaker

Release mode and accessory code

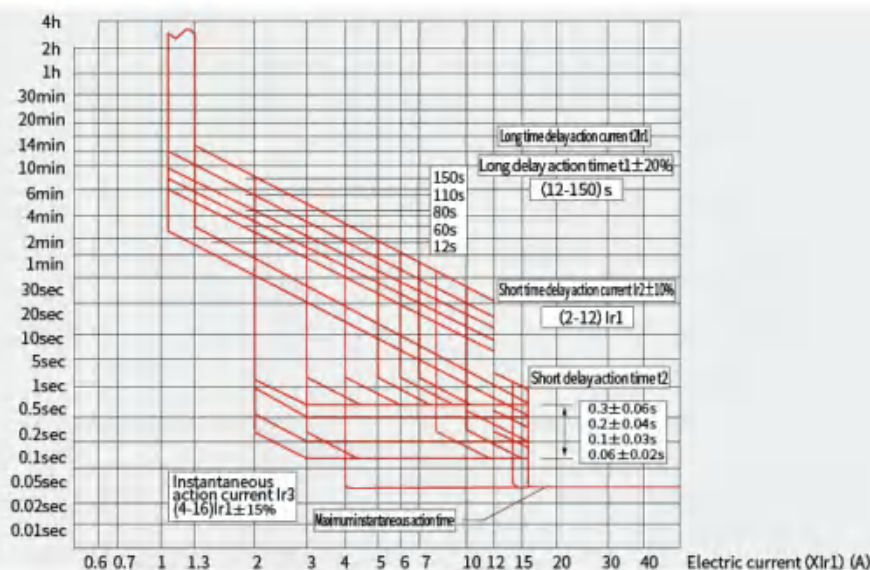


- Alarm contact
- Shunt release
- Lead direction
- Auxiliary contact
- Undervoltage release

Note: A. 300 represents circuit breaker without accessories in the table
b. 348 auxiliary contacts in ZQM1E-630 and ZQM1E-800 are a pair of contacts (i.e. one normally open and one normally closed) 368 auxiliary contacts are three pairs of contacts (i.e. three normally open and three normally closed)

Model		ZQM1E-125, 250	ZQM1E-400		ZQM1E-630, 800
Number of poles		3 pole, 4 pole	3 pole, 4 pole	4 pole	3 pole, 4 pole
Additional	Attachment name				
308	Alarm contact	← □ □ □	← □ □ □	← □ □ □	← □ □ □
310	Shunt release	← ● □ □	← ● □ □	← ● □ □	← ● □ □
320	Auxiliary contact	← ■ □ □	← ■ □ □	← ■ □ □	← ■ □ □
330	Undervoltage release	← ○ □ □	← ○ □ □	← ○ □ □	← ○ □ □
340	Shunt release, auxiliary contact			← ■ □ □	← ■ □ □
350	Shunt release Undervoltage release				← ○ □ □
360	Two sets of auxiliary contacts			← ■ □ □	← ■ □ □
370	Auxiliary contact Undervoltage release			← ○ □ □	← ○ □ □
318	Shunt release Alarm contact				← ● □ □
328	Auxiliary contact Alarm contact	← ■ □ □	← ■ □ □	← ■ □ □	← ■ □ □
338	Undervoltage release Alarm contact				← ○ □ □
348	Shunt release Auxiliary contact, alarm contact				← ● □ □
368	Two sets of auxiliary contacts Alarm contact			← ■ □ □	← ■ □ □
378	Auxiliary contact, alarm contact of undervoltage release				← ○ □ □

Circuit breaker characteristic curve



ZQM1E Intelligent Moulded Case Circuit Breaker

Power loss and derating coefficient

Model	Power on current (A)	Three-phase total power loss (VA)	
		Front and rear plate wiring	Plug in wiring
ZQM1E-125	125	35	40
ZQM1E-250	250	62	70
ZQM1E-400	400	115	125
ZQM1E-630	630	190	210
ZQM1E-800	800	262	294

Ambient temperature		+40°C	+45°C	+50°C	+55°C	+60°C
Model	Coefficient	Lineup coefficient	Lineup coefficient	Lineup coefficient	Lineup coefficient	Lineup coefficient
ZQM1E-125		1In	0.95In	0.89In	0.84In	0.76In
ZQM1E-250		1In	0.96In	0.91In	0.87In	0.82In
ZQM1E-400		1In	0.94In	0.87In	0.81In	0.73In
ZQM1E-630		1In	0.91In	0.85In	0.80In	0.74In
ZQM1E-800		1In	0.88In	0.83In	0.79In	0.76In

Note: The above derating coefficients are all measured under the rated current of the shell frame.

Characteristics of intelligent release

◇ Release characteristics

It has the protection functions of load long delay inverse time, short circuit short delay inverse time, short circuit short delay definite time, short circuit instantaneous action, etc. It can be set by users to form the required protection characteristics.

◇ Inverse time limit action characteristics of long time delay overcurrent protection

Electric current		Actuation time								
For power distribution	1.05I _{r1}	> 2h no action								
	1.3I _{r1}	≤ 1h action								
	2I _{r1}	Setting time t1	Imm-125/250A				Imm-400/630/800A			
			12	60	80	100	12	60	100	150
Motor for household use	1.05I _{r1}	> 2hno action								
	1.2I _{r1}	< 1h action								
	1.5I _{r1}	Action time T1	Imm-125/250A				Imm-400/630/800A			
			21.3	107	142	178	21.3	107	178	267
	2I _{r1}	Action time T1	12	60	80	125	12	60	125	150
	7.2I _{r1}	Setting time t1	0.93	4.63	6.17	7.72	0.93	4.63	7.72	11.6

Note: 1. The action time conforms to $i2t_1 = (2I_{r1})^2 t_1$ ($1.2 \leq 1 < i_{r2}$); 2. The action time tolerance is $\pm 20\%$;

3. The returnable time shall not be less than 70% of the action time.

Electric current		Actuation time			
$I_{r2} \leq 1 < 1.5I_{r2}$	Inverse time limit	$I^2 T_2 = (1.5I_{r2})^2 t_2$			
	Setting time t ₂ (s)	0.06	0.1	0.2	0.3
$1.5I_{r2} \leq 1 < I_{r3}$	Definite time limit	Tolerance (s)	± 0.02	± 0.03	± 0.04
	Returnable time (s)			0.14	0.21

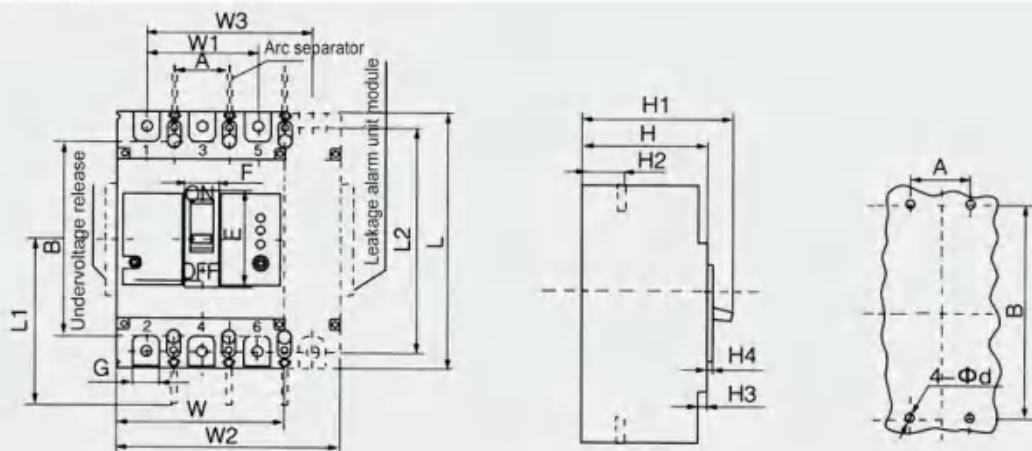
◇ If the user has no special requirements when ordering, the characteristic parameters of the release are configured in the following table.

Overload long delay	Setting current I _{r1}	In	
	Time delay t ₁	60s	
Short circuit short time delay	Setting current I _{r2}	8I _{r10.3}	
	Time delay t ₂	0.3s	
Short circuit instantaneous short circuit	Setting current I _{r3}	Inm=125、250、400、630	12I _{r1}
		Inm=800	10I _{r1}
Pre-alarm	Setting current I _{r0}	0.9I _{r1}	

ZQM1E Intelligent Moulded Case Circuit Breaker

Outline and installation opening size

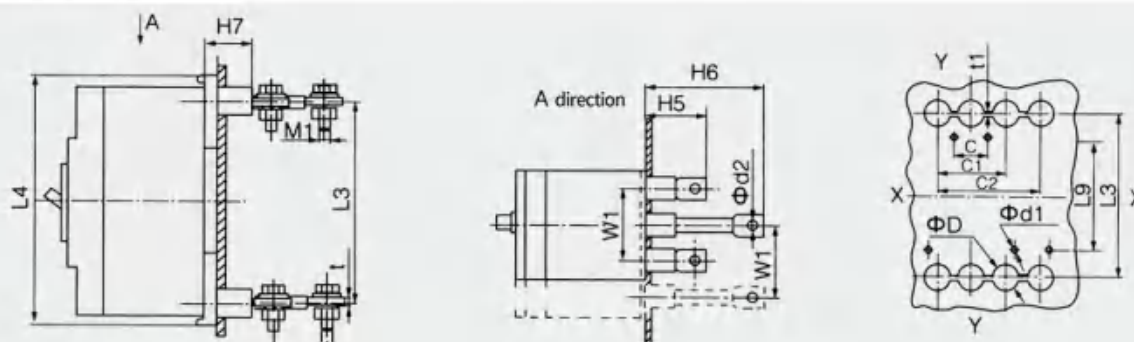
◇ Front panel wiring



◇ Outline installation opening size

Model	ZQM1E outline and installation opening size (mm)																	
	Front panel wiring																	
	W	W1	L	L1	L2	H	H1	H2	H3	H4	E	F	G	W2	W3	A	B	Φd
ZQM1E-125	92	60	150	125	132	92	110	28.5	10	4	50	22	17.6	122	90	30	129	4.5
ZQM1E-250	107	70	165	132.5	144	90	152	24	5	4	62	22	22	142	105	35	126	4.5
ZQM1E-400	150	96	257	220.5	224	106.5	146.5	38	4.5	3.5	88.6	65	30	198	144	44	194	7
ZQM1E-630	181.5	116	270	185	234	112	152	45.5	8	7	88.5	66	44	240	154.5	58	200	7
ZQM1E-800	210	140	280	240	243	115.5	152	45.3	8	6	81	66	44	280	210	70	243	7

◇ Rear panel wiring

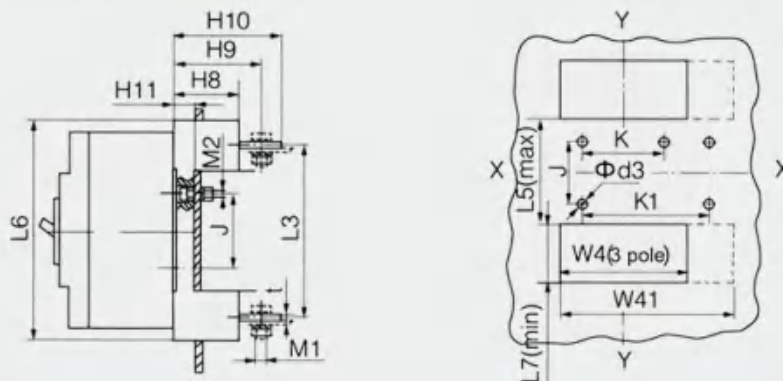


Model	ZQM1E outline and installation opening size (mm)													
	Rear panel wiring													
	C	C1	C2	L9	t	Φd2	L3	L4	H5	H6	ΦD	M	Φd1	H7
ZQM1E-125	30	60	90	129			132	164	53	93	22	M8	5.5	35
ZQM1E-250	35	70	105	126	5	8.5	144	173	55	125	24	t1 ≥ 3	5.5	35
ZQM1E-400	44	96	144	194	8.5	10.5	224	267	67.5	127.5	32	≥ 3	6.5	37
ZQM1E-630	58	116	154.5	200	16	13	234	270	48	80	40	≥ 3	6.5	37
ZQM1E-800	70	140	210	243	16	13	243	295	50	83	40	≥ 3	7	37

ZQM1E Intelligent Moulded Case Circuit Breaker

Outline and installation opening size

◇ Plug-in front and rear panel wiring

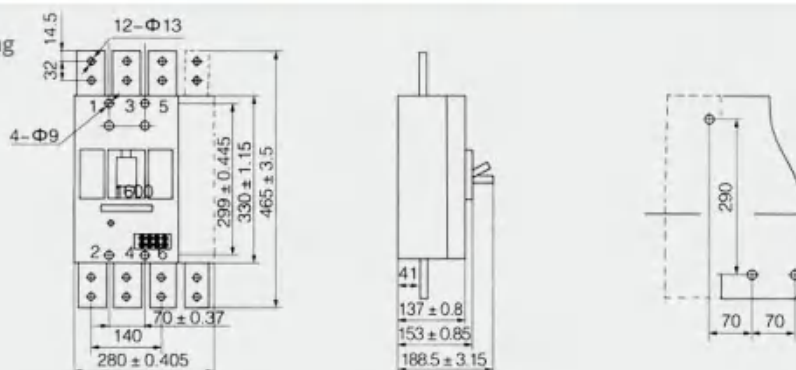


◇ Outline installation opening size

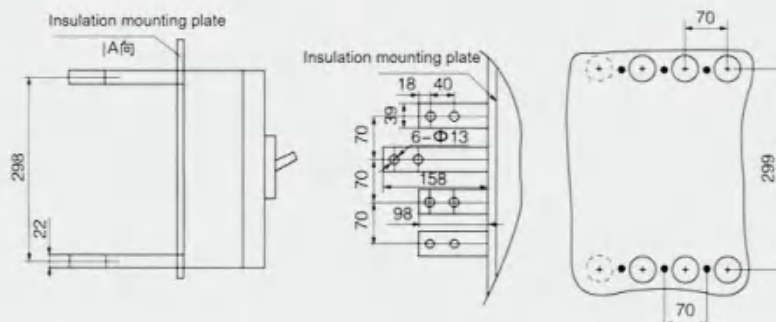
Model	ZQM1E outline installation opening size (mm)														
	Plug-in front and rear panel wiring														
	L5	L6	H8	H9	H10	H11	M1	M2	J	K	K1	L7	W4	W41	Φd3
ZQM1E-125	90	168	50	64	76	17.5	M8	M6	56	60	90	41	94	125	6.5
ZQM1E-250	88	183	50	71.5	86.5	17.5	M8	M6	54	70	105	51	110	145	6.5
ZQM1E-400	166	279	60	83.5	106.5	21	M10	M8	129	60	108	58	152	200	8.5
ZQM1E-630	160	300	67	60	110	22	M12	M8	123	125	158	75	192	252	10
ZQM1E-800	171	205	87	87	109	27	M12	M8	143	90	162	72	220	290	10

Outline and installation dimensions of ZQM1E-1250 (1600)

◇ Front panel wiring



◇ Rear panel wiring

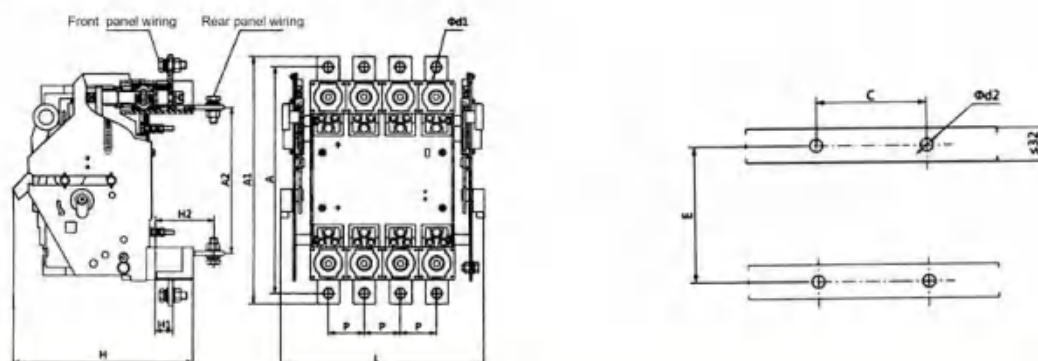




ZQM1E Intelligent Moulded Case Circuit Breaker

Outline and installation dimensions of ZQM1E-1250 (1600)

◇ Drawout (drawer-type) front and rear wiring



◇ Outline installation opening size (mm)

Model	Drawout (drawer-type) front and rear wiring											
	A	A1	A2	H	H1	H2	P	L	C	E	Φd1	Φd2
ZQM1E-400/3P	312	340	194	248	24	78	48	223	96	140	Φ11	Φ7
ZQM1E-630/3P	343	381	200	277	37	102	58	258	116	140	Φ13	Φ7
ZQM1E-800/3P	--	--	--	--	--	--	--	--	--	--	--	--
ZQM1E-1250/3P ZQM1E-1600/3P	485	515	261	280	29	48	70	265	140	140	Φ13.5	Φ9

Internal accessories of circuit breaker

The circuit breaker accessories can be directly led out or bywires equipped with terminal blocks according to user needs.

◇ Undervoltage release

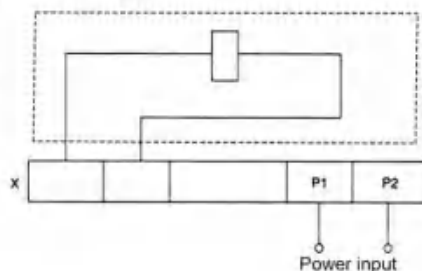
The undervoltage tripping device is type C: AC50Hz 230V, 400V. See table for power of undervoltage release.



Wiring diagram of external undervoltage module
(Wiring diagram of internal accessories of circuit breaker is shown in the dotted frame)

Overload long delay	Undervoltage release power (VA)	
	AC230V	AC400V
ZQM1E-125	2.6	3.3
ZQM1E-250	3.8	3.3
ZQM1E-400	3.7	2.7
ZQM1E-630	2.5	2.8
ZQM1E-800	2.5	2.8
ZQM1E-1600	2.5	2.8

When the rated working voltage is 35%~70%, the undervoltage release shall reliably trip the circuit breaker. When the rated working voltage is 85%~110%, the undervoltage release shall ensure that the circuit breaker can be closed. When the rated working voltage is lower than 35%, the undervoltage release shall prevent the circuit breaker from closing.



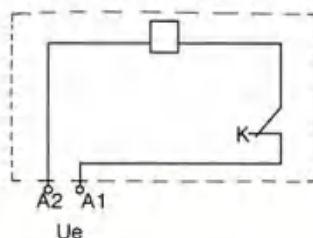
Warning: The undervoltage release must be power on before the circuit breaker can be tripped and closed again. Otherwise, the circuit breaker will be damaged!
Symbol description: X is the terminal block.

ZQM1E Intelligent Moulded Case Circuit Breaker

Internal accessories of circuit breaker

◇ Shunt release

According to the line diagram (the internal accessories of the switch are in the dotted box). Voltage specification: AC50Hz, 230V, 400V, DC220V. When the rated control power supply voltage is 70~110%, the shunt release shall reliably trip the circuit breaker.



K: The normally closed contact of the microswitch in series with the coil inside the shunt release will automatically open when the circuit breaker is opened and close when it is closed.

◇ Alarm contact



The circuit breaker is in the position of "opening" and "closing"	B14 ——— B11 B12 ———
The position when the circuit breaker is in "free tripping" (alarm)	B11, B14 change from off state to on state. B11, B12 change from on state to off state.

◇ Auxiliary contact



When the circuit breaker is in the "off" position	F14 ——— F11 F12 ———
When the circuit breaker is in the "on" position	F11, F14 change from off state to on state. F11, F12 change from on state to off state

◇ Rated current of auxiliary contact and alarm contact

Classification	Rated current of shell frame grade I_{nm} (A)	Agreed heating current I_{th} (A)	The rated working current I_e (A) at AC400V	The rated working current I_e (A) at DC220V
Auxiliary contact	≤ 250	3	0.3	0.15
	≤ 400	3	0.4	0.2
Alarm contact	$\leq 100 \leq I_{nm} \leq 630$		AC220V/1A	0.15

◇ Power on operation performance of auxiliary contact and corresponding experimental conditions

Use category	Put through			Breaking			Number of poweron operation cycles	Number of operation cycles per minute	Power on time
	I/I_e	U/U_e	$\cos\phi$ 或 $T_{0.95}$	I/I_e	U/U_e	$\cos\phi$ 或 $T_{0.95}$			
AC-15	10	1	0.3	10	1	0.3	6050	6	$\geq 0.05s$
DC-13	1	1	6Pe	1	1	6Pe			$\geq T_{0.95}$

◇ Connecting and breaking capacity of auxiliary contacts under abnormal conditions

Use category	Put through			Breaking			Number of poweron operation cycles	Number of operation cycles per minute	Power on time
	I/I_e	U/U_e	$\cos\phi$ 或 $T_{0.95}$	I/I_e	U/U_e	$\cos\phi$ 或 $T_{0.95}$			
AC-15	10	1.1	0.3	10	1.1	0.3	10	2	$\geq 0.05s$
DC-13	1.1	1.1	6Pe	1.1	1.1	6Pe			$\geq T_{0.95}$

Note: the above two tables

a. $T_{0.95}=6Pe$ is an empirical formula, where Pe is in watts and $T_{0.95}$ is in milliseconds.

b. When the total times of circuit breaker operation performance are less than 6050, the times of power on operation performance of auxiliary contact can be equal to the total times of circuit breaker operation performance.

c. The operating frequency and power on time are allowed to be consistent with the main circuit of the circuit breaker.

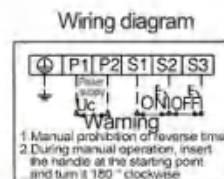
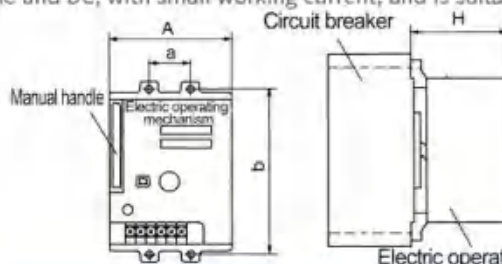
ZQM1E Intelligent Moulded Case Circuit Breaker

Circuit breaker external accessories

◇ CD2 electric operating mechanism

Features and uses:

CD2 series electric operating mechanism adopts advanced switching power supply technology and is driven by small permanent magnet motor. It can be used for both AC and DC, with small working current, and is suitable for 63-800A molded case circuit breaker.



Electric operating mechanism	Model of circuit breaker	Overall installation dimensions				Rated voltage (V)	Action current (V)	Mechanical life (times)	Motor power (W)
		a	b	A	H				
CD2-125/ M	ZQM1E-125	30	129	90	92	AC 230/110V DC 250/110V	≤ 0.5	10000	14
CD2-225/ M	ZQM1E-225	35	126	90	93				
CD2-400/ M	ZQM1E-400	44	194	130	143				
CD2-630/ M	ZQM1E-630	58	201	130	143				
CD2-800/ M	ZQM1E-800	70	243	130	147	AC 230/110V DC 250/110V	≤ 2.0	5000	35
CD2-1250/ M	ZQM1E-1250	70	300	130	153				
CD2-1600/ M	ZQM1E-1600								

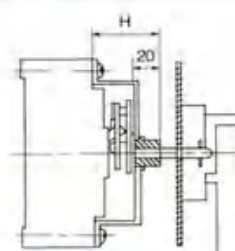
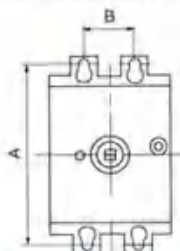
Rotating handle operating mechanism

◇ Rotating handle operating mechanism (common for three-pole and four-pole circuit breakers)

Purpose: This mechanism is specially used for ZQM1E series molded case circuit breakers. It can realize the requirements for the operation of drawer cabinets, distribution cabinets, power boxes, etc. on the panel by rotating the handle, and ensure that the door panel of the cabinet cannot be opened when the circuit breaker is closed (i.e. interlocked with the door).

Features: The operating mechanism adopts a unique design and transmission structure, and realizes the closing, opening and re tripping of the molded case circuit breaker by rotating the handle. Flexible and stable operation, small operation force, convenient installation, and the overall performance and quality of the mechanism are superior to other similar products.

Overall dimensions of rotary handle operating mechanism



Manual operating mechanism	Distribution circuit breaker model	A	B	H
CT2-127.4	ZQM1E-125	129	30	61
CT2-127.5	ZQM1E-250	142	35	57
CT2-237.2	ZQM1E-400	194	138	87
CT2-228.3	ZQM1E-630	201	166	97
CT2-2310.4	ZQM1E-800	243	197	87

Note:

- ◇ The corresponding MCCB model number of the operating mechanism panel of the rotary handle is ZQM1E-125, "127.4", and ZQM1E-250, "127.5"; ZQM1E-400 No. "237.2"; ZQM1E-630 No. "228.3"; ZQM1E-800 No. "2310.4".
- ◇ CT2 rotary manual operating mechanism can be equipped with two kinds of operating handles, one is "F" type square handle, and the other is "A" type round handle. See the figure below for the hole size of the door panel.
- ◇ The length of square shaft D=150mm, if the length is greater than 150mm, it shall be noted when ordering.
- ◇ When ordering, if the handle is equipped with "F-type" handle, add "F", if the handle is equipped with "A-type" handle, add "A", and the order writing method is as follows: "Model and its meaning".

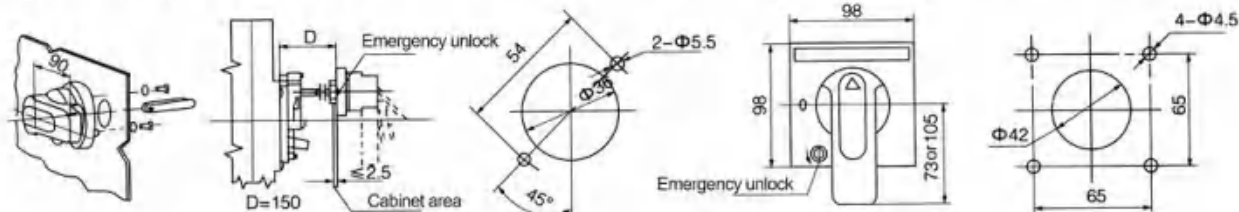
Warning to the user: the manual operating mechanism of this circuit breaker must be ordered from our factory to ensure the product quality. If the user purchases the manual operating mechanism by himself or after installation, our factory will not be responsible for any adverse consequences.

ZQM1E Intelligent Moulded Case Circuit Breaker

Overall dimensions of rotary handle operating mechanism

◇ Operating handle characteristics

- when the circuit breaker is in the closing state, the cabinet door can not be opened;
- If the operating handle or manual operating mechanism fails in the closing state, the cabinet door can be opened through the emergency unlocking device on the operating handle;
- The opening of the door plate of the corresponding manual operating mechanism with different specifications and the matched manual handle is consistent.



Hole size of "A" handle panel

Hole size of "F" handle panel

Test current and sectional area of wire

The sectional area of the connecting wire for temperature rise test and the corresponding test current.

Rated current value A	10	16.20	25	32	40.50	63	80	100	125	140	160	180.200.225	250	315	400
sectional area of wire mm ²	1.5	2.5	4	6	10	16	25	35	50	50	70	95	120	185	240

Rated current value A	Cable sectional area mm ²		Copper bar size	
	Quantity	Sectional area mm ²	Quantity	Size
500	2	150	2	30x5
630	2	185	2	40x5
800	2	240	2	80x5

Terminal block type

The terminal blocks are divided into JGC, JBC and JB models which are selected by users

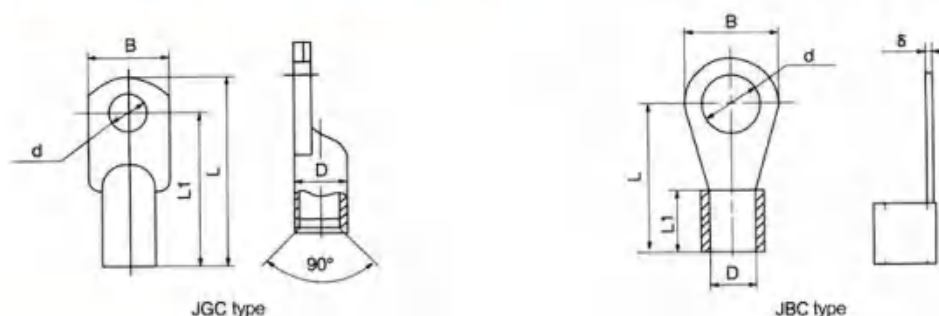
Rated current value A	Cable sectional area mm ²		Copper bar size	
	Quantity	Sectional area mm ²	Quantity	Size
500	2	150	2	30x5
630	2	185	2	40x5
700.800	2	240	2	50x5
1000			2	60x5
1600			2	80x5

Model	Current A	Wire sectional area mm ²	Terminal model	B	L	L1	D	d
ZQM1E-125	10.16.20	2.5	JBC2.5-8	15	28	8.5	Φ2.6	Φ8.2
	32	6	JBC6-8	15	30	10	Φ3.5	Φ8.2
	40.50	10	JBC10-8	15	32	11	Φ4.5	Φ8.2
	63	16	JGC16-8	17	41	33.5	Φ6	Φ8.2
	80	25	JGC25-8	17	46	38.5	Φ7	Φ8.2
	100	35	JGC35-8	17	52	44.5	Φ8	Φ8.2
	125	50	JGC50-8	17	52	44.5	Φ8	Φ8.2
ZQM1E-250	125	50	JGC50-8	22	54	45	Φ10	Φ8.2
	160	70	JGC70-8	22	61	52	Φ11	Φ8.2
	180.200.225	95	JGC95-8	22	66	57	Φ13	Φ8.2
	250	120	JGC120-8	22	66	57	Φ13	Φ8.2

Note: Due to the continuous improvement of product technology, all data shall be subject to the latest data confirmed by our company. In case of any change, no further notice will be given.

ZQM1E Intelligent Moulded Case Circuit Breaker

Overall dimension and installation drawing



Use and maintenance

- ◇ Various characteristics and accessories of the circuit breaker shall be set by the manufacturer and can not be adjusted randomly in use.
- ◇ The handle of the circuit breaker can be located in each position, indicating the three states of closing, breaking and tripping respectively. When the handle is in the tripping position, pull the handle backward to make the circuit breaker trip again and then close.
- ◇ The maintenance and inspection must be carried out by professionals.
- ◇ If users need to select internal and external accessories, our company will provide them according to the ordered model and ensure the quality. If the user chooses to purchase or refit by himself/herself, our company will not be responsible.
- ◇ Before performing maintenance operations, the following operations must be completed:
 - Open the circuit breaker;
 - Disconnect the power supply from the circuit breaker (including main circuit and auxiliary circuit);
 - Remove the circuit breaker from the installation position (generally used for plug-in type, preferably fixed type).
- ◇ The circuit breaker shall be maintained once a year under normal operating conditions and once half a year under abnormal operating conditions. The following are the maintenance contents:

Clean the arc separator and replace it if necessary.

Insulation test:

- (1) Use a 500VDC megger, when the circuit breaker is in the off state, to respectively conduct the test between the incoming and outgoing connecting plates 1-2, 3-4, 5-6 and between the 135 connecting plates (three connecting plates are connected with wires) and the shell (the shell is covered with metal foil).
- (2) The undervoltage release connect to the main circuit, between the incoming line and the circuit breaker shell.
- (3) The insulation resistance should be no less than 20MΩ.

Check all connections, wipe the oxide with emery cloth, and tighten the studs and nuts after cleaning with soluble agent.

If the circuit breaker is equipped with a manual operating mechanism, manually open and close the circuit breaker for three times (if the circuit breaker is also equipped with an undervoltage release, the undervoltage release should be powered on before operation). The operating lever or handle should move freely.

If the circuit breaker is installed with an electric operating mechanism, the circuit breaker shall be opened and closed for three times by electric operation (if the circuit breaker is also installed with an undervoltage release, the undervoltage release shall be powered on before operation). The electric operation control function shall be normal.

If the circuit breaker is equipped with a shunt release, the circuit breaker shall be closed first, and then the shunt release shall pass the rated voltage, and the circuit breaker shall trip reliably.

If the circuit breaker is equipped with an undervoltage release, the undervoltage release will close the circuit breaker after passing the rated voltage to make the circuit breaker in the closing state. Then the undervoltage release shall be de energized, the circuit breaker shall be reliably tripped, and the circuit breaker can not be closed at this time.

If the circuit breaker is installed with auxiliary and alarm contacts, the auxiliary and alarm contacts, opening, closing and tripping circuit breakers shall be connected in the test circuit, and the auxiliary and alarm conversion signals shall be normal.

If the circuit breaker is installed with plug-in device, the circuit breaker shall be moved for 3-5 times, and the function and sliding of its plug-in components shall be normal without jamming.

ZQM1E
Intelligent Moulded Case Circuit Breaker

Use and maintenance

The rated current value (A)	Fault description	Possible causes	Trouble shooting
1	The circuit breaker is used for motor protection. It trips during startup and fails to start.	1、 If the motor is started directly, the starting current is at least 8 times of the normal operating current, or even more than 10 times. If the multiple of instantaneous protection current setting is inappropriate, the motor will trip during the starting process and can not complete the starting.	1、 Find out whether the load is the direct starting and the starting current of the motor. 2、 Reasonably determine the setting action current and action current multiple of the circuit breaker.
		2、 If the distribution cabinet is far away from the equipment and the line voltage drop is large, the terminal voltage of the motor is lower than the voltage value reflected in the table on the cabinet. The starting current will increase, causing tripping.	1、 Find out the motor terminal voltage ($P=IUCOS\Phi$). 2、 Reasonably determine the setting action current and action current multiple of the circuit breaker.
		3、 If the motor is started with mechanical load, check whether the load is normal and reliable. If the mechanical operation part is blocked and noisy, poor operation will cause difficulty in starting, sudden increase of current value and long starting time, which will cause tripping. In addition, if the equipment such as water pump and conveyor belt are started with load, the starting current will also increase and trip.	1、 Check the operation of the mechanical part of the motor (load). 2、 Reasonably determine the setting action current and action multiple of the circuit breaker.
2	Tripping occurs when the circuit breaker is in operation.	1、 The three-phase load is unbalanced, causing overload tripping.	Find out whether the three-phase current is balanced.
3	In case of short circuit override trip during the operation of the circuit breaker, there may be the following two kinds of situations: 1. The molded case circuit breaker does not trip the universal circuit breaker trips. 2. The low-voltage circuit breaker does not trip the high-voltage side protective apparatus trips.	1、 Generally, the matching of protection characteristics of each series circuit breaker is improper, and there is no appropriate safety time. 2. During the analysis, the circuit conditions shall be understood, including the length and section of the connecting cable, the estimation of short circuit current, the estimation of the passing current of the main circuit of the circuit breaker, the occurrence time of short circuit fault, etc.	1、 Go to the site to check the status of the circuit breaker. If there is no disconnection rejection, the product should be normal. 2、 Test the characteristics to judge whether the circuit breaker is qualified or not. 3、 Reasonable use the circuit breaker.



Striving for perfection is the driving force that we have been insisting on. Grasp every detail to make the product more perfect.



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Intelligent universal circuit breaker

Molded case circuit breaker

Intelligent molded case circuit breaker

Leakage molded case circuit breaker

Miniature circuit breaker

Self-resetting overvoltage and undervoltage

dual power switch

Load disconnecter

Contactor thermal relay

Branch/busbar

ZQM1L

Plastic case circuit breaker with residual current protection



ZQM1L Plastic case circuit breaker with residual current protection

Product overview

- ◇ ZQM1L series plastic case circuit breaker with residual current protection (hereinafter referred to as circuit breaker) is one of the new circuit breakers developed by our factory with international advanced design and manufacturing technology.
- ◇ The rated insulation voltage is 800V, which is suitable for infrequent switching and infrequent motor starting in circuits with AC 50Hz, rated working voltage of 400V and rated working current of 16A to 800A.
- ◇ The circuit breaker has overload, short circuit and undervoltage protection functions, which can protect lines and power equipment from damage.
- ◇ At the same time, it can also provide protection against fire hazards caused by long-term grounding faults that cannot be detected by overcurrent protection.
- ◇ Conforming standards: IEC60947-2, GB/T 14048.2.

Model meaning

ZQ M 1 L - 250 M ZA / 4 300 2 B I Y 125mA AC220V 160A

- Operating current (optional)
- Rated voltage value of accessories
- Rated residual dynamic current
- Rated dynamic current time (y delay type, w non-delay type)
- Leakage alarm module optional (type I and type II).
- Optional code of quadrupole product (A, B, C, D)
- Optional code for different purposes (2, "or no code")
- Internal accessory code of tripping mode
- Optional code of number (3, 4)
- External attachment code (P: electric operation, ZA round handle operation, ZF square handle manual operation)
- Breaking capacity (M, H)
- Shell frame grade (125, 225, 400, 630, 800)
- Leakage type code (L: with residual current protection)
- Design serial number
- Product model
- Name of the company

Note

- ◇ Shell frame grade current optional : $I_{nm}=125, I_{nm}=250, I_{nm}=400, I_{nm}=630, I_{nm}=800$.
- ◇ Optional codes of rated breaking capacity: L standard type (35kA) and M high breaking type (50 kA)
- ◇ Optional code of operation mode: No code for direct operation of the handle, P for electric operation and Z for rotary handle operation;
- ◇ Rated current optional:
The frame current 125 is 16, 20, 25, 32, 40, 50, 63, 80, 100, 125;
The frame current 250 is 100, 125, 140, 160, 180, 200, 225 and 250;
The frame current 400 is 225, 250, 315, 350, 400;
The frame current 630 is 400, 500, 630;
The frame current 800 is 630, 700, 800;
- ◇ Optional code of pole number : 3 indicates three poles and 4 indicates four poles;
- ◇ Optional codes for tripping mode and accessory code: 2 represents electromagnetic tripping (i.e. instantaneous), 3 represents multiple tripping (thermal+electromagnetic), (the last two digits "00" represents the code of six accessories: see the attachment table for details);
- ◇ Optional codes for different purposes: no code for power distribution protection, 2 for motor protection
- ◇ Indicates the optional code for N-pole structure of four-pole circuit breaker:
Type A N-pole is not equipped with overcurrent tripping element, and the N-pole is always connected, and is not closed or opened with other three poles;
Type B N-pole is not equipped with overcurrent tripping element, and the N- pole is closed and opened with other three poles;
- ◇ Optional code for leakage alarm module mode: I indicates leakage alarm module sends leakage signal and the circuit breaker trips, II indicates leakage alarm module sends leakage signal but the circuit breaker does not trip.
- ◇ Optional code for delay function of residual action current protection: W - indicates no delay, i.e. no delay function, Y - indicates delay function, and Δt has 0.1s, 0.5s and is adjustable;

ZQM1L Plastic case circuit breaker with residual current protection

Model meaning

- Rated residual operating current: the residual current value of ZQM1L-125, 250 and 400 shells is constant, and the regulation is divided into three grades: 100mA, 300mA and 500mA, which can be adjusted. ZQM1L-630, 800 shell frame, the residual current value is generally 300mA, 500mA and 1250mA, which can be adjusted in three gears.
- Rated voltage value is AC220V and AC380V;
- Rated voltage value of accessories: conventional shunt release, rated voltage value of AC220V, AC380V, DC24V, conventional undervoltage release.
- Optional according to the wiring methods: front panel wiring, rear panel wiring, plug-in wiring, and plug-in front wiring.

Applicable working environment and installation conditions

- The altitude of the installation site is 2000m and below;
- The surrounding medium temperature shall not be higher than +40°C and not lower than -5°C; And the 24-hour average value shall not exceed 35°C (except for special orders);
- The relative humidity of the air at the installation site shall not exceed 50% when the maximum temperature is +40°C; There can be a higher relative humidity at a lower temperature. The monthly average minimum temperature of the wettest month does not exceed +25 °C, and the monthly average maximum relative humidity of the month does not exceed 90%. In addition, the condensation on the product surface caused by temperature changes should be considered;
- The pollution level is 3;
- Protection level: IP20;
- The installation category of the main circuit of the circuit breaker is III, and the installation category of the auxiliary circuit and control circuit which are not connected to the main circuit is II;
- In the place where there is no explosive medium and there is no gas and conductive dust that can corrode metal and damage insulation;
- In a place free from rain and snow;
- Circuit breakers shall be installed according to the product instructions.

Release mode and internal accessory code

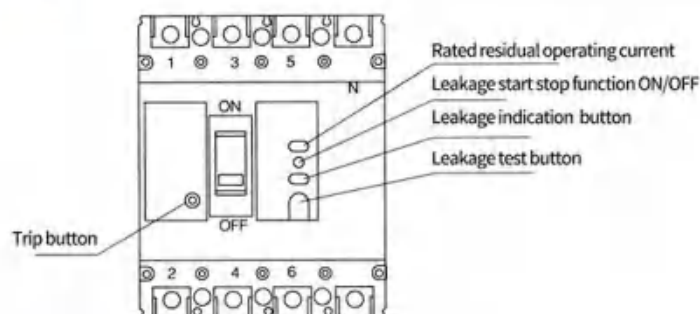


Attachment name	Code of release and accessory		Accessory installation side and lead laying			
	Electromagnetic tripping release	Multiple release	ZQM1L-125/3 □ ZQM1L-250/3 □	ZQM1L-125/4 □ ZQM1L-250/4 □	ZQM1L-400/3 □ ZQM1L-630/3 □ ZQM1L-800/3 □	ZQM1L-400/4 □ ZQM1L-630/4 □ ZQM1L-800/4 □
No attachment	200	300				
Alarm contact	208	308				
Shunt release	210	310				
Auxiliary contact	220	320				
Undervoltage release	230	330				
Shunt release, auxiliary contact	240	340				
Two sets of auxiliary contacts	260	360				
Auxiliary contact, undervoltage release	270	370				
Shunt release, alarm contact	218	318				
Auxiliary contact, alarm contact	228	328				
Undervoltage release, alarm contact	238	338				
Shunt release, auxiliary contact and alarm contact	248	348				
Two groups of auxiliary contacts and alarm contacts	268	368				
Auxiliary contact, undervoltage release, alarm contact	278	378				

ZQM1L

Plastic case circuit breaker with residual current protection

Structure introduction



Main technical performance indexes

Model		ZQM1L-125		ZQM1L-250		ZQM1L-400		ZQM1L-630		ZQM1L-800	
Rated current of shell frame grade Inm(A)		100		250		400		630		800	
Rated current In(A)		16、20、25、32 40、50、63 80、100、125		125、125 140、160、180 200、225、250		225、250 315、350、400		400、500、630		630、700、800	
Number of poles		3		3		3		3		3	
		4		4		4		4		4	
Rated insulation voltage Ui(V)		AC800									
Rated working voltage Ue(V)		AC400									
Rated working frequency (AC)		50/60Hz									
Rated impulse withstand voltage Uimp(V)		8000									
Arc distance (mm)		≥ 50		≥ 50		≥ 100		≥ 100		≥ 100	
Segmentation cability level		L	M	L	M	L	M	L	M	M	
Ultimate short-circuit sectioning capacity Icu(KA)	AC400V	32	50	35	50	65	100	65	100	100	
Operating short-circuit sectioning capability Ics(KA)	AC400V	22	35	22	35	42	50	42	50	50	
Rated residual short-circuit switching-on (sectioning) capacity IΔ m(kA)		8.75	12.5	8.75	12.5	13.5	25	13.5	25	25	
Rated residual operating current IΔ no(mA)	Non-delay	30/100/500		30/100/500		100/300/500		100/300/500		100/300/500	
	Delay	100/300/500		125/300/500		100/300/500		100/300/500		100/300/500	
Rated residual nonoperating current IΔ no(mA)		1/2 IΔ n									
Operating performance (times)	Power on	1500		1000		1000		1000		1000	
	No electricity	8500		7000		4000		4000		4000	
Residual current protection action time		IΔ n		2 IΔ n		5 IΔ n		10 IΔ n		10 IΔ n	
Maximum segmentation time (S)	Non-delay	0.2		0.1		0.04		0.04		0.04	
	Delay	0.5/1.15/2.15		0.31/1/2		0.25/0.9/1.9		0.25/0.9/1.9		0.25/0.9/1.9	

Note: The breaking capacity level of bipolar products is only M-type; The maximum breaking time of delay type can be customized according to customer's requirements.

◇ Derating coefficient of ambient temperature change

Ambient temperature		+40°C	+45°C	+50°C	+55°C	+60°C
Model	Coefficient	Lineup coefficient	Lineup coefficient	Lineup coefficient	Lineup coefficient	Lineup coefficient
ZQM1L-125		$1I_n$	$0.95I_n$	$0.89I_n$	$0.84I_n$	$0.76I_n$
ZQM1L-250		$1I_n$	$0.96I_n$	$0.91I_n$	$0.87I_n$	$0.82I_n$
ZQM1L-400		$1I_n$	$0.94I_n$	$0.87I_n$	$0.81I_n$	$0.73I_n$
ZQM1L-630		$1I_n$	$0.91I_n$	$0.85I_n$	$0.80I_n$	$0.74I_n$
ZQM1L-800		$1I_n$	$0.88I_n$	$0.83I_n$	$0.79I_n$	$0.76I_n$

Note: The above derating coefficients are all measured under rated frame current.

ZQM1L Plastic case circuit breaker with residual current protection

Protection characteristics

- ◇ The thermal release of circuit breaker has inverse time limit characteristic.
The electromagnetic release is instantaneous action, and its characteristics are shown in Table 3 (for power distribution) and Table 4 (for motor protection).

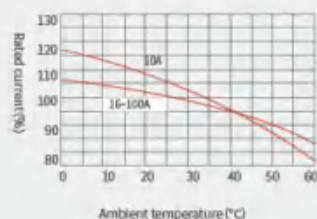
Rated current of tripper(A)	Thermal release (ambient temperature+40°C)		Action current of electromagnetic (A)
	1.05I _n (cold state) inactivity time (h)	1.30 I _n (hot state) action time (h)	
I _n ≤ 63	≥ 1	< 1	10I _n ± 20%
63 < I _n ≤ 125	≥ 2	< 2	
125 < I _n ≤ 630	≥ 2	< 2	5I _n ± 20%, 10I _n ± 20%

Note: For ZQM1L-225 four-pole circuit breaker, there is no 5I_n specification for the electromagnetic release (short circuit protection) of the neutral pole (N).

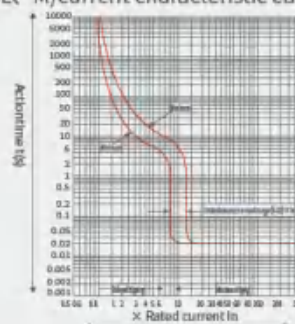
Rated current of release(A)	Thermal release (ambient temperature+40°C)				Action current of electromagnetic(A)
	1.0I _n (cold state) Inactive time (h)	1.2I _n (hot state) Action time (h)	1.5I _n (hot state) Action time (h)	7.2I _n (cold state) Action time (h)	
10 < I _n ≤ 400	2	2	8min	2s ≤ T _p ≤ 20s	12I _n ± 20%

Characteristic curve of circuit breaker

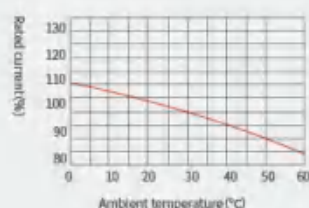
◇ Current-temperature characteristics



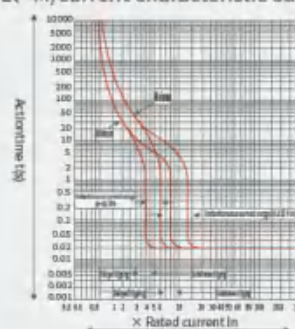
◇ ZQM1L-125L, M/current characteristic curve (power distribution)



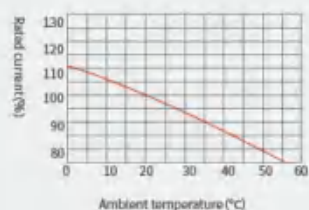
◇ Current-temperature characteristics



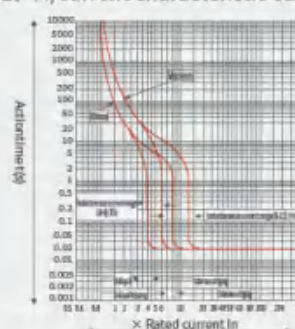
◇ ZQM1L-225L, M/current characteristic curve (power distribution)



◇ Current-temperature characteristics



◇ ZQM1L-400L, M/current characteristic curve (power distribution)

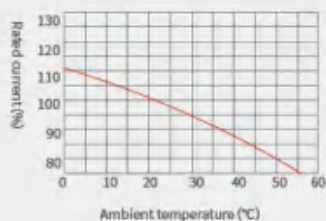




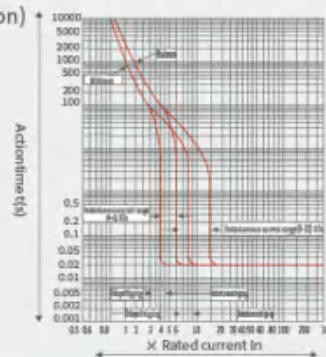
ZQM1L
Plastic case circuit breaker with residual
current protection

Characteristic curve of circuit breaker

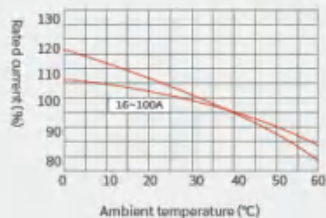
◇ Current-temperature characteristics



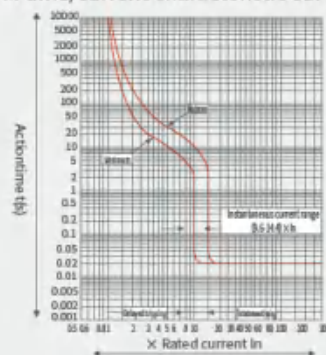
◇ ZQM1L-630M、800M time/current characteristic curve (power distribution)



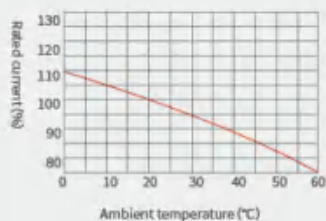
◇ Current-temperature characteristics



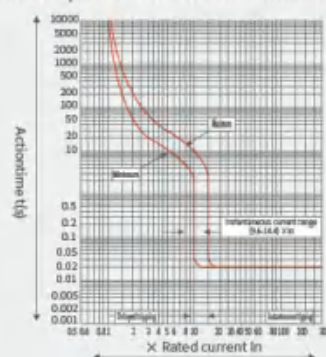
◇ ZQM1L-125L、M time/current characteristic curve (Motor)



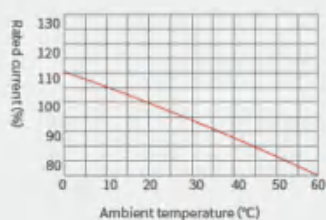
◇ Current-temperature characteristics



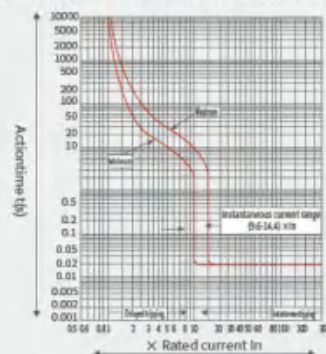
◇ ZQM1L-250L、M time/current characteristic curve (Motor)



◇ Current-temperature characteristics



◇ ZQM1L-400L、M time/current characteristic curve (Motor)

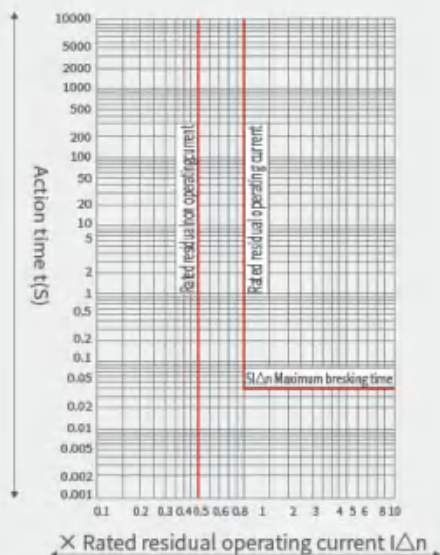


ZQM1L

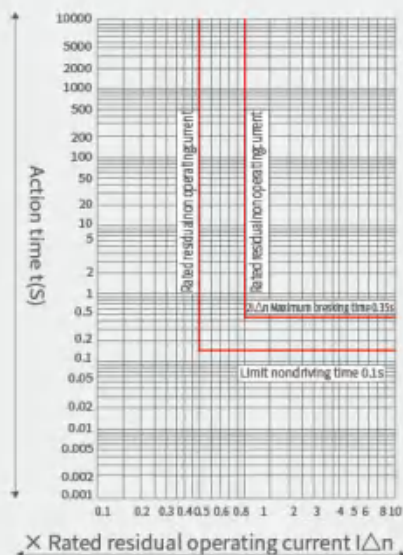
Plastic case circuit breaker with residual current protection

Characteristic curve of circuit breaker

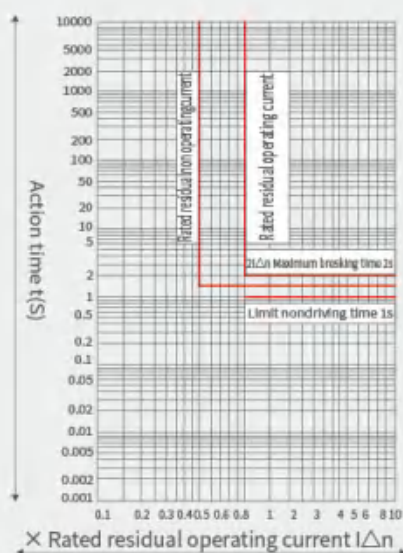
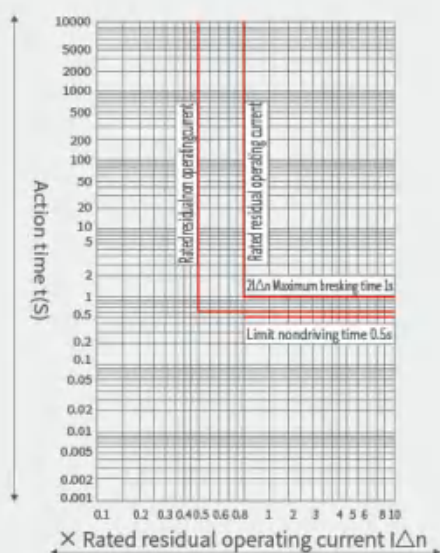
◇ $I_{\Delta n}=100\text{mA}$ 、 300mA 、 500mA non-delayed residual current protection time/current characteristic curve



◇ $I_{\Delta n}=100\text{mA}$ 、 300mA 、 500mA 、 1250mA delay residual current protection time/current characteristic curves



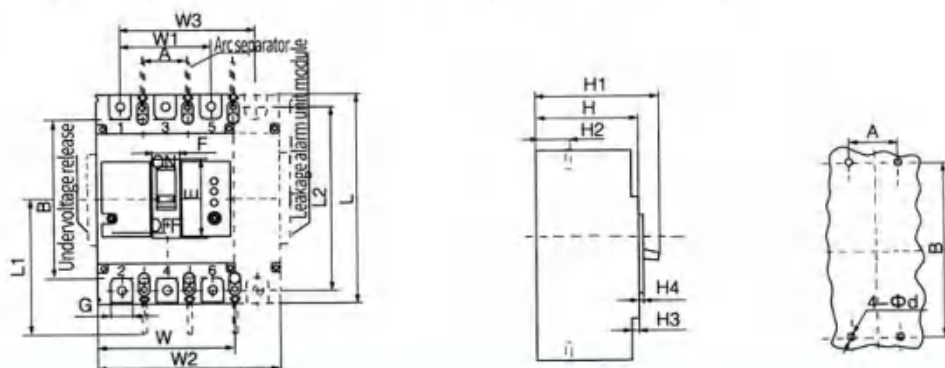
◇ $I_{\Delta n}=100\text{mA}$ 、 300mA 、 500mA 、 1000mA delay residual current protection time/current characteristic curves



ZQM1L Plastic case circuit breaker with residual current protection

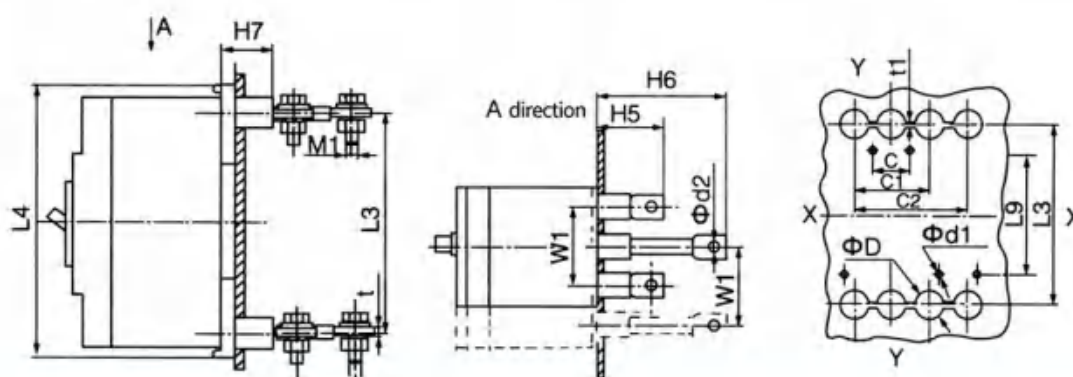
Outline and installation opening size

◇ Outline drawing of front panel wiring and dimension drawing of installation opening



	Outline and installation opening size																	
Model	Front panel wiring																	
	W	W1	L	L1	L2	H	H1	H2	H3	H4	E.	F	G	W2	W3	A	B	Φd
ZQM1L-125L	92	60	150	125	132	75	92	26	10	4	50	22.5	18	122	90	30	129	4.5
ZQM1L-125M	92	60	150	125	132	92	110	28.5	10	4	50	22.5	18	122	90	30	129	4.5
ZQM1L-250L	107	70	165	132.5	144	73	92	26	6	4	50	22.5	23	142	105	35	126	4.5
ZQM1L-250M	107	70	165	132.5	144	91	110	23.5	6	4	50	22.5	23	142	105	35	126	4.5
ZQM1L-400L、M	150	96	257	220.5	224	107	147	38	9	5	86	56	32.5	198	144	44	194	7
ZQM1L-630L、M	210	140	280	240	243	114	158	42	10.5	6	86	64	45	280	210	70	243	7
ZQM1L-800M	210	140	280	240	243	114	158	42	10.5	6	86	64	45	280	210	70	243	7

◇ Outline drawing of rear panel wiring and dimension drawing of installation opening

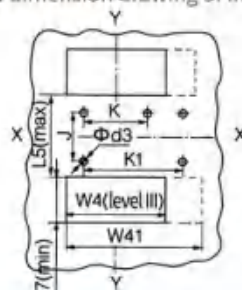
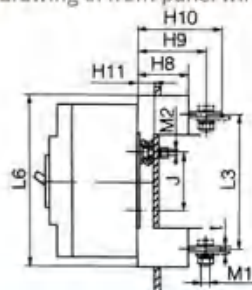


Model	Outline and installation opening size													
	Rear panel wiring													
	C	C1	C2	L9	t	Φd2	L3	L4	H5	H6	ΦD	M	Φd1	H7
ZQM1L-125L	30	60	90	129	/	6	132	164	53	93	22	M8	5.5	35
ZQM1L-125M	30	60	90	129	/	6	132	164	53	93	22	M8	5.5	35
ZQM1L-250L	35	70	105	126	5	8.5	144	173	55	125	24	t1 ≥ 3	5.5	35
ZQM1L-250M	35	70	105	126	5	8.5	144	173	55	125	24	t1 ≥ 3	5.5	35
ZQM1L-400L、M	44	96	144	194	8.5	10.5	224	267	67.5	127.5	32	≥ 3	6.5	37
ZQM1L-630L、M	70	140	210	243	16	13	243	295	50	83	40	≥ 3	7	37
ZQM1L-800M	70	140	210	243	16	13	243	295	50	83	40	≥ 3	7	37

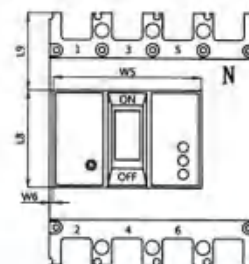
ZQM1L Plastic case circuit breaker with residual current protection

Characteristic curve of circuit breaker

◇ Outline drawing of front panel wiring and dimension drawing of installation opening



◇ Opening size of ZQM1L series panel



Model	Outline and installation opening size																		
	Plug-in panel front/rear																		
	L5	L6	H8	H9	H10	H11	M1	M2	J	K	K1	L7	W4	W41	Φd3	W5	L8	L9	W6
ZQM1L-125L	90	168	50	64	76	17.5	M8	M6	56	60	90	41	94	125	6.5	88	50.5	50	2.0
ZQM1L-125M	90	168	50	64	76	17.5	M8	M6	56	60	90	41	94	125	6.5	88	50.5	50	2.0
ZQM1L-250L	88	183	50	71.5	86.5	17.5	M8	M6	54	70	105	51	110	145	6.5	102	50.5	54	2.5
ZQM1L-250M	88	183	50	71.5	86.5	17.5	M8	M6	54	70	105	51	110	145	6.5	102	50.5	54	2.5
ZQM1L-400L、M	166	279	60	83.5	106.5	21	M10	M8	129	60	108	58	152	200	8.5	140	91	83	5.0
ZQM1L-630L、M	171	205	87	87	109	27	M12	M8	143	90	162	72	220	290	10	182	91	94.5	15
ZQM1L-800M	171	205	87	87	109	27	M12	M8	143	90	162	72	220	290	10	182	91	94.5	15

Circuit breaker internal accessories

The circuit breaker accessories can be directly led out or equipped with terminal blocks according to user needs.

◇ Undervoltage release

- The undervoltage release is type c: AC50Hz 230V and 400V.
- See the table for power of undervoltage release .



Model	Undervoltage release power (VA)	
	AC230V	AC400V
ZQM1L-125	2.6	33
ZQM1L-250	3.8	3.3
ZQM1L-400	3.7	2.7
ZQM1L-630	2.5	2.8
ZQM1L-800	2.5	2.8

When the rated working voltage is 35%~ 70%, the undervoltage device shall reliably trip the circuit breaker;

When the rated working voltage is 85% ~ 110%, the undervoltage release shall ensure that the circuit breaker can be closed.

When the rated working voltage is lower than 35%, the undervoltage release shall prevent the circuit breaker from closing.

Wiring diagram of external undervoltage module (wiring diagram 1 of internal accessories of circuit breaker is shown in the dotted box)

Notice: The undervoltage release must be powered on before the circuit breaker can be tripped and closed again. Otherwise, the circuit breaker will be damaged!

◇ Shunt tripping release

- Voltage specification: AC50Hz230V, 400v; DC220V
- When the rated control power supply voltage is 70~110%, the shunt release shall reliably trip the circuit breaker.
- K: The microswitch in series with the coil inside the shunt release is a normally closed contact. When the circuit breaker is opened, the contact will automatically open and close when it is closed. . Wiring diagram (wiring diagram 2 of the internal accessories of the circuit breaker is shown in the dotted box)

◇ Leakage alarm unit module

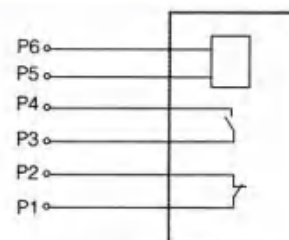
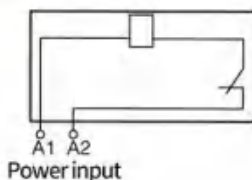
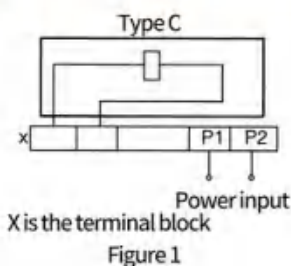
- The leakage alarm unit module has two ways, which can be explained by the user when ordering.
- When leakage occurs, the leakage alarm module sends a signal and the circuit breaker is tripped at the same time mode 1 (indicated by I)
- when leakage occurs, the leakage alarm module sends a signal, but the circuit breaker is not tripped mode 2 (indicated by N), and the wiring diagram (The dotted frame is the wiring diagram of the internal accessories of the leakage alarm module) .

Note: The second way is to meet the needs of special occasions. Users should consider carefully when using this function to protect electrical appliances.



ZQM1L Plastic case circuit breaker with residual current protection

Circuit breaker internal accessories



Specification: Terminal P5- P6 input power is AC50Hz 230V or 400V. P1-P2 and P3-P4 contact capacity are AC230V5A.

Note: P1 -P2 is normally closed contact and P3-P4 is normally open contact.

◇ Alarm contact

The circuit breaker is in the position of "opening" and "closing"	B12 B11
The circuit breaker is in the position of "free tripping" (alarm).	B11、B14 change from off state to on state B11、B12 change from on state to off state

◇ Auxiliary contact

When the circuit breaker is in the "open" position	F12 F11
When the circuit breaker is in the "close" position	F11、F14 change from off state to on state F11、F12 change from on state to off state

◇ Rated current of auxiliary contact and alarm contact

Classification	Rated current of shell frame grade $I_{nm}(A)$	Agreed heating current $I_{th}(A)$	Rated working current $I_e(A)$ at AC400V	Rated working current $I_e(A)$ at DC220V
Auxiliary contact	≤ 225	3	0.3	0.15
	≥ 400	3	0.4	0.2
Alarm contact	$100 \leq I_{nm} \leq 630$		AC220V/1A	0.15

◇ Power-on operation performance and corresponding test conditions of auxiliary contact

Use category	Put through			Breaking			Number of power on operation cycles	Number of operation cycles per minute	Power on time
	I/I_e	U/U_e	$\cos\Phi$ or $T/0.95$	I/I_e	U/U_e	$\cos\Phi$ or $T/0.95$			
AC-15	10	1	0.3	10	1	0.3	6050	6	$\geq 0.05s$
DC-13	1	1	$6P_e$	1	1	$6P_e$			$\geq T/0.95$

◇ Power-on operation performance and corresponding test conditions of auxiliary contact

Use category	Put through			Breaking			Number of power on operation cycles	Number of operation cycles per minute	Power on time
	I/I_e	U/U_e	$\cos\Phi$ or $T/0.95$	I/I_e	U/U_e	$\cos\Phi$ or $T/0.95$			
AC-15	10	1.1	0.3	10	1.1	0.3	10	2	$\geq 0.05s$
DC-13	1.1	1.1	$6P_e$	1.1	1.1	$6P_e$			$\geq T/0.95$

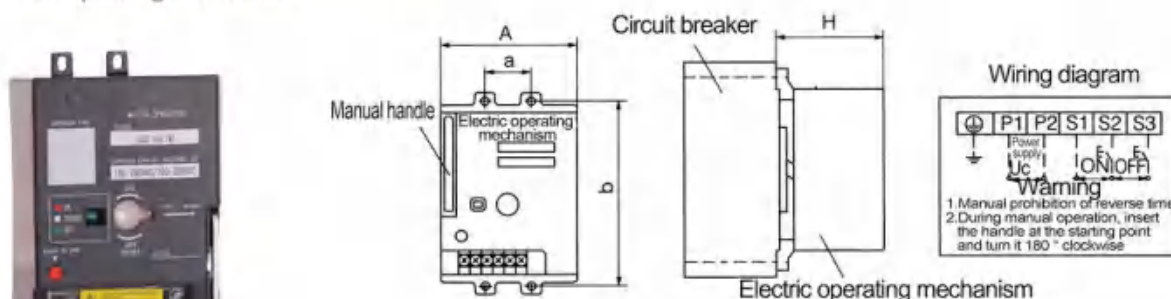
Note: the above two tables

- $T=6P_e$ is the empirical formula, where P_e is in watts and T is in milliseconds;
- When the total number of operating performance of the circuit breaker is less than 6050, the number of power-on operating performance of the auxiliary contact can be equal to the number of operating performance of the circuit breaker;
- The operating frequency and power-on time are allowed to be consistent with the main circuit of the circuit breaker.

ZQM1L Plastic case circuit breaker with residual current protection

Circuit breaker internal accessories

◇ CD2 motor operating mechanism



Note: After the circuit breaker trips, the electric operating mechanism must make the circuit breaker trip again before closing.

◇ CD2 Electric operating mechanism appearance and installation dimension, wiring diagram, starting current, power and life

Electric operating mechanism	Circuit breaker model	Overall dimension of installation (mm)				Rated voltage (V)	Action current (A)	Mechanical life (times)	Motor power (W)
		a	b	A	H				
CD2-125/ M	ZQM1L-125	30	129	90	92	AC 230/110V	≤ 0.5	14000	14
CD2-250/ M	ZQM1L-250	35	126	90	93	DC 250/110V			
CD2-400/ M	ZQM1L-400	44	194	130	143	AC 230/110V	≤ 2.0	5000	35
CD2-630/800 M	ZQM1L-630/800	70	243	130	147	DC 250/110V			

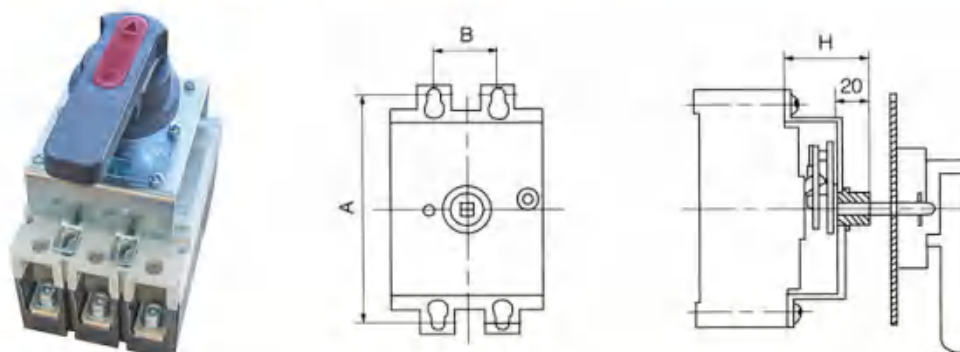
Rotating handle operating mechanism

◇ Rotary handle operating mechanism (common for three-pole and four-pole circuit breakers)

Purpose: This mechanism is specially used for ZQM1L series molded case circuit breaker. It can realize the requirements of drawer cabinet, power distribution cabinet, power box, etc. on the panel by rotating the handle, and ensure that the cabinet door panel can not be opened when the circuit breaker is closed (that is, it is interlocked with the door).

Features: The operating mechanism adopts a unique design and transmission structure. The closing, opening and re-tripping of the molded case circuit breaker are realized by rotating the handle. The operation is flexible and stable, the operation force is small, the installation is convenient, and the overall performance and quality of the mechanism are superior to other similar products.

Overall dimensions of rotary handle operating mechanism



Manual operation	Circuit breaker model	A	B	H
CT2-127.4	ZQM1L-125	129	30	61
CT2-127.5	ZQM1L-250	142	35	57
CT2-237.2	ZQM1L-400	194	138	87
CT2-2310.4	ZQM1L-630(800)	243	197	87

ZQM1L Plastic case circuit breaker with residual current protection

Overall dimensions of rotary handle operating mechanism

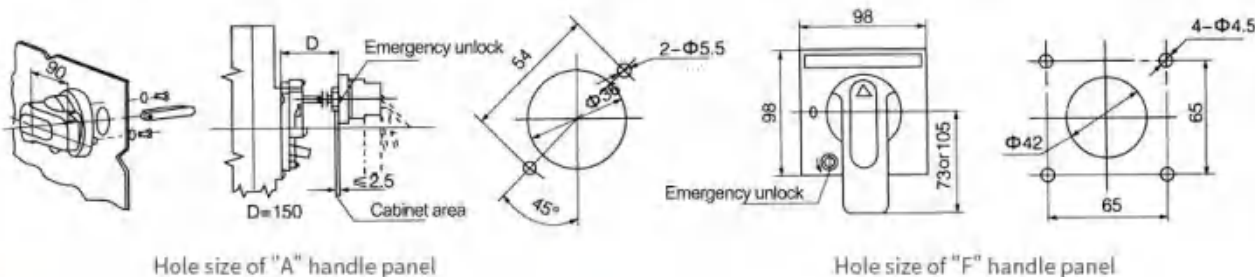
Note:

1. The MCCB model corresponding to the panel number of the rotating handle operating mechanism is: ZQM1L-125 number "127.4"; ZQM1L-250No. "127.5"; ZQM1L-400No. "237.2"; ZQM1L-630No. "228.3"; ZQM1L-800No. "2310.4".
2. The CT2 rotary manual operating mechanism can be equipped with two operating handles; One is "F" type square handle; The other is "A" type round handle, and its door panel opening size is shown in the figure below.
3. The length of the square shaft $D=150\text{mm}$. If the length is greater than 150mm, it shall be noted when ordering.
4. When ordering, if the handle is equipped with "F type" handle, add "F"; if the handle is equipped with "A type" handle, add "A"; the order is written as "model and its meaning".

Warning to the user: the manual operating mechanism required for this circuit breaker must be ordered from our factory to ensure the product quality. If the user purchases the manual operating mechanism by himself or after installation, our factory will not be responsible for any adverse consequences.

Operating handle features

- a. The cabinet door can not be opened when the circuit breaker is closed
- b. If there is a fault in the operating handle or manual operating mechanism is in the closing state, the cabinet door can be opened by the emergency unlocking device on the handle
- c. The opening of the door panel corresponding to the operating mechanism of different specifications is consistent.



Rated current and conductor sectional area

Cross-sectional area of connecting wires and corresponding rated current.

Rated current value (A)	10	16,20	25	32	40,50	63	80	125	125,140	160	180,200,225	250	315,350	400
Wire cross-sectional area (mm ²)	1.5	2.5	4	6	10	16	25	35	50	70	95	120	185	240

The rated current value (A)	Electric cable		Copper bar	
	Quantity	Sectional area (mm ²)	Quantity	Sectional area (mm ²)
500	2	150	2	30x5
630	2	185	2	40x5
800	2	240	2	80x5

Notice when ordering

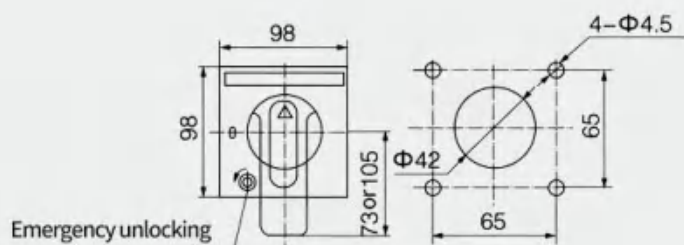
- When ordering, the user must indicate the model, specification and accessories of the circuit breaker, and the residual current operating time (i.e., non-delay type and delay type). When ordering the undervoltage release and shunt release, the user should indicate the voltage value of the working power supply (or control power supply).
- For example, ZQM1L-125 four-pole, rated current is 50A, residual action time type is delay type, with rotating handle operating mechanism, with leakage alarm unit module, and operates in mode 1, neutral pole type is C, shunt release (AC400V), and 20 sets are connected behind the board.
- Namely, it is written as order ZQM1L-125Z/4310C1, In=50A, the remaining action time type is delay type, shunt release AC400V, 20 sets of wiring behind the board, and the leakage module needs to provide rated working voltage.

Note: Due to the continuous improvement of product technology, all data shall be subject to the confirmation of the latest data of the company, and are subject to change without notice.

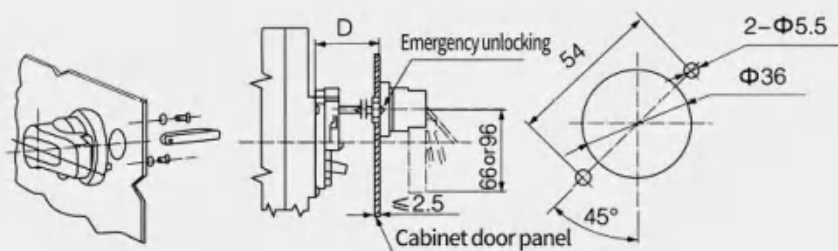
ZQM1L Plastic case circuit breaker with residual current protection

◇ Operating handle features

- a、When the circuit breaker is in the closing state, the cabinet door cannot be opened;
- b、If the operating handle or the hand-operated mechanism fails in the closing state, the cabinet door can be opened by the emergency unlocking device on the operating handle;
- c、corresponding to different specifications of hand-operated mechanism, matching hand-operated handle, the door opening is consistent.



The shape of F-shaped square handle and the opening size of door panel shall be no less than 100mm from the hinge

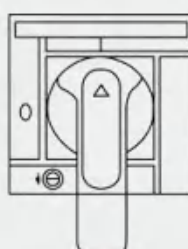


Type A round handle shape and door panel opening size (the distance from the opening center to the hinge is not less than 100mm)

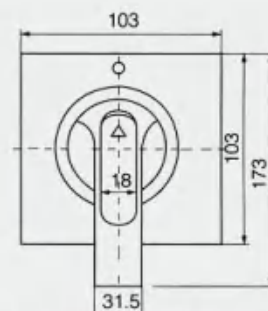
Handle diagram



Type "A"



Type "F"



1250 hand operator handle



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Intelligent universal circuit breaker

Molded case circuit breaker

Intelligent molded case circuit breaker

Leakage molded case circuit breaker

Miniature circuit breaker

Self-resetting overvoltage and undervoltage

dual power switch

Load disconnect

Contactors thermal relay

Branch/busbar

ZQM1EL

Electronic molded case circuit breaker (leakage type)



ZQM1EL Electronic molded case circuit breaker (leakage type)



Product overview

- ◇ This type of controller is applicable to the environment of three-phase four-wire auxiliary power supply. Its rated insulation voltage is 800V, which is suitable for infrequent conversion and infrequent motor starting in circuits with AC 50Hz, rated working voltage up to 690V and rated current up to 1250A. The circuit breaker has overvoltage protection, undervoltage protection, phase loss protection, overload long delay inverse time limit, short circuit short delay inverse time limit, short circuit short delay definite time limit, short circuit instantaneous and undervoltage protection, and leakage tripping protection functions, which can protect the line and power equipment from damage.
- ◇ The product complies with the following standards: GB 14048.2, DL/T 2018 Molded Case Circuit Breaker Communication Protocol
- ◇ It passed the acceptance test of Jiangsu Electric Power Research Institute of the State Grid.
- ◇ It passed the communication test consistency test of the protocol laboratory of Jiangsu Electric Power Research Institute of China.

Product features

- ◆ Protection function:
 - ◇ With overvoltage, undervoltage and phase loss protection functions; Electronic overload, short circuit short time delay, instantaneous protection and leakage tripping protection functions; And power failure tripping function.
- ◆ Display function:
 - ◇ 12864 dot matrix LCD display, friendly Chinese human-computer interface.
 - ◇ Under the closing state, the current three-phase voltage, three-phase current, residual current, current time and rated current parameters will be displayed automatically.
 - ◇ In the opening state, the current trip information is frozen and displayed.
- ◆ Setting and query functions:
 - ◇ Enable, alarm and disable the overvoltage, undervoltage, phase loss, overload, residual current, open circuit delay and instantaneous protection functions by pressing the key. The above functions can also be set through communication.
 - ◇ Key can be used to set the main parameters such as overvoltage, undervoltage, phase loss, residual current, rated current, short circuit short delay multiple, short circuit short delay time, short circuit instantaneous multiple, real-time clock and user password.
 - ◇ You can query, trip records, trip times, and many other parameters by pressing keys.
- ◆ Control function:
 - ◇ It can be controlled through remote reservation opening, closing and self-inspection, as well as reservation cancellation.
 - ◇ The synchronous opening function of the circuit breaker can be realized through the external opening interface.
- ◆ Monitoring and recording function:
 - ◇ Record the three-phase voltage, the three-phase current daily maximum value and time scale, and minimum value and time scale in the last 30 days, with 12 records in total.
 - ◇ Record nearly 10 times of circuit breaker action events, gate status change events, circuit breaker alarm events, high-voltage side power failure events, and function on/off events
 - ◇ Accumulate the number of protection trips and record the number of different fault trips.
- ◆ Auxiliary functions:
 - ◇ The RS485 communication function fully complies with the protocol requirements of the version of Communication Protocol for Molded Case Circuit Breakers (without leakage) issued by Jiangsu Province in 2018, as well as the requirements of the General Technical Specification for Molded Case Circuit Breakers and the Special Technical Specification for Molded Case Circuit Breakers issued by Jiangsu Province in 2018.
 - ◇ Highlight LCD screen and four buttons to realize field operations such as function setting, parameter setting, gate position information query, trip times query, factory maintenance, etc. The remote upgrade function is realized through RS485 communication port. The upgrade mode meets the requirements of communication protocol of molded case circuit breaker of Jiangsu Electric Power Company.
- ◆ Performance and process
 - ◇ The circuit board is made of highly integrated industrial materials and adopts advanced lightning protection design, which fully meets the requirements of electromagnetic compatibility in GB14048.2-2008 standard
 - ◇ The circuit board adopts compact structure design, which is suitable for users' requirements for compact space in the circuit breaker.
 - ◇ The process of the circuit board is neat and beautiful, and the wiring is convenient. Only necessary signal input wiring is required.
 - ◇ It can be directly assembled without secondary commissioning. After assembly, simply calibrate the voltage and current by pressing the button.
 - ◇ The product basically includes the functions of current electronic molded case circuit breaker products.
 - ◇ It can be designed and developed according to the structure (or original circuit board) of the customer's prototype according to the customer's requirements.

ZQM1EL Electronic molded case circuit breaker (leakage type)

Normal working conditions

- ◇ Ambient temperature $-5^{\circ}\text{C} \sim +55^{\circ}\text{C}$;
- ◇ When the average minimum temperature of the wettest month of relative air humidity does not exceed 25°C , the monthly average maximum relative humidity of the month does not exceed 90%, taking into account the condensation on the product surface due to temperature changes;
- ◇ The altitude does not exceed 2,000 meters;
- ◇ Pollution level III
- ◇ Installation category III;
- ◇ The external magnetic field of the installation site shall not exceed 5 times of the geomagnetic field in any direction.

Technical parameters

Model specification		ZQM1EL-250		ZQM1EL-400		ZQM1EL-800	
Shell frame current		250A		400A		800A	
Rated current		100~250A		200~400A		630~800A	
Rated working voltage							
Rated insulation voltage							
Number of poles (p)		3	4	3	4	3	4
Breaking capacity grade	Icu(kA)	50	50	85	85	85	85
	Ics(kA)	35	35	55	55	55	55
	Icw(kA/s)	2.7/0.4	2.7/0.4	5/1	5/1	10/1	10/1
Use category		A		B		B	
Operating performance (times)	Power on	1000		1000		500	
	No electricity	7000		4000		2500	

Main performance indicators of controller

Model	Description of parameter
Rated current of shell frame grade $I_{nm}(A)$	60, 250, 400, 630, 800 optional
Rated current $I_n(A)$	$0.4 \sim 1.0I_{nm}$ (A) continuously adjustable
Overload delay time (s)	3-18s adjustable
Short circuit short delay multiple (xI_n)	2-12 adjustable
Short circuit short delay time (ms)	30-600 continuously adjustable
Short circuit instantaneous multiple (xI_n)	4-14 Adjustable
Auxiliary power supply voltage $U_e(AC\ V)$	400
Applicable pole number	4P or 3P+N
Overvoltage action value (v)	Default $285 \pm 5\%$ (user adjustable)
Undervoltage action value (v)	Default $165 \pm 5\%$ (user adjustable)
Phase loss action value (v)	Default $120 \pm 5\%$ (user adjustable)
Product use category	Class B
Rated residual operating current (mA) $I_{\Delta n}$:	Gear values optional, and 8 groups of parameter values can be customized according to customer requirements.
Rated residual non-operating current (mA))	$I_{\Delta no} = 50\%I_{\Delta n}$
Rated limit non-driving time (s)	Gear values optional and 3 groups of parameter values can be customized according to customer requirements.

ZQM1EL Electronic molded case circuit breaker (leakage type)

Action performance of release

◆ Overload protection feature (inverse time limit action)

Rated working current of release(A)	Release (ambient temperature 40°C)	
	1.05I _n (cold)	1.30I _n (hot)
I _n ≤ 63A	≥ 1h no action	< 1h action
I _n > 63A	≥ 2h no action	< 2h action

Calculation of overload long delay time: $T1 = (6I_{r1}/I)2 \times Tr1$

(I_{r1}: rated current setting value, I: fault current, Tr1: delay overload coefficient)

◆ Instantaneous overcurrent release current setting value

Rated current of shell frame grade I _{nm} (A)	Setting current multiple	Agreed time
160	10 I _n ± 20%	< 0.2s
250	10 I _n ± 20%	< 0.2s
400	10 I _n ± 20%	< 0.2s
630	10 I _n ± 20%	< 0.2s
800	10 I _n ± 20%	< 0.2s

Handling instructions

◆ Key description (see Figure 6-3)

- ◇ The circuit breaker has 【Menu】 , 【Shift】 , 【Increment】 , 【Return】 and four buttons. The shortcut keys are defined as follows:
- ◇ 【Menu】 Enter the main menu, and use the confirmation key during the setting process. (See Figure 6-4)
- ◇ 【Shift】 Enter the password correctly, and enter the parameter setting interface. It is used for shift or decrease function during setting.
- ◇ 【Increment】 Query the current real-time parameters. Used increment key in the setting process.
- ◇ 【Return】 Press and hold this key for 5 seconds to enter the quick function setting interface. It is used for return in the setting
- ◇ 【Increment】 + 【Return】 Press two buttons at the same time, and the password is entered correctly to enter the data clearing interface.

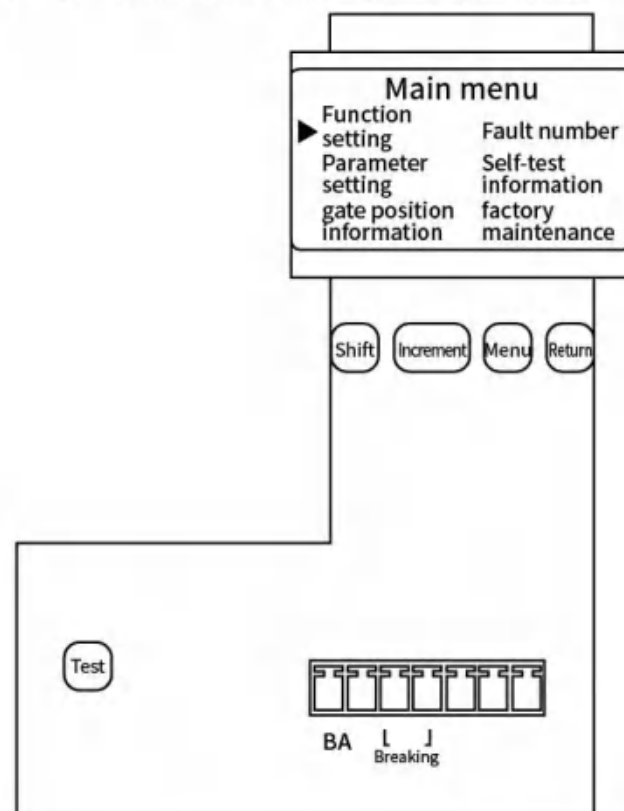


Figure 6-1 Type 250 and 400 human-computer interaction panel

ZQM1EL
Electronic molded case circuit breaker
(leakage type)

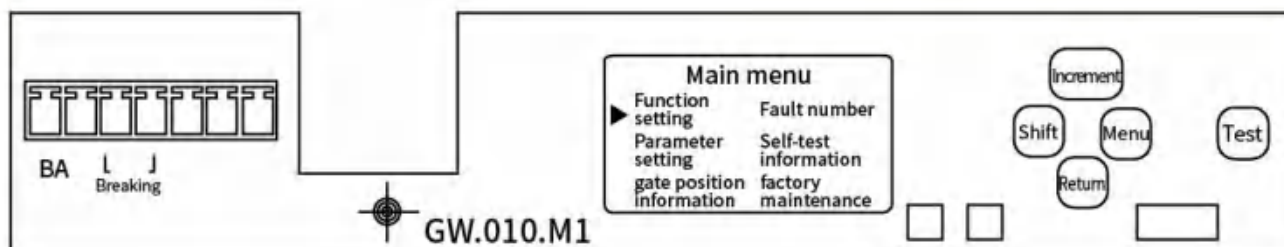


Figure 6-2 Type 630 and 800 human-computer interaction panel

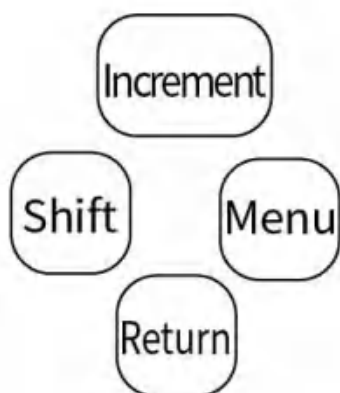


Figure6-3

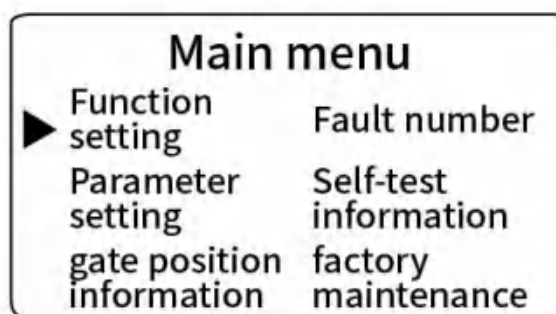


Figure6-4

◆ Display descriptions (see Figure 6-4)

- ◇ Dot matrix high brightness LCD display, intuitive and accurate display.
- ◇ Three indicator lights indicate the gate status, alarm status and communication status of the protector respectively.
- ◇ Status indicator light: when the circuit breaker is in the closing state, the indicator light is off, and when the circuit breaker is in the opening state, the indicator light is always on.
- ◇ Warning indicator light: When the circuit breaker has a fault and gives an alarm, the indicator light is always on, and it goes out when there is no alarm.
- ◇ Communication indicator light: When the circuit breaker receives the complete data frame, the indicator light flashes once.

◆ Operation display descriptions:

- ◇ Circuit breaker operation display: the circuit breaker is in the closing operation state, as shown in Figure 6-5, and Figure 6-6 shows the current operation parameters in turn; The current tripping state and current fault information are shown in Figure 6-7 when the circuit breaker is in the opening state.

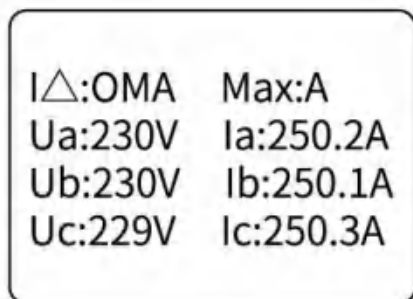


Figure 6-5

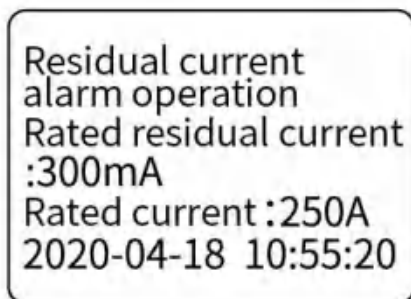


Figure 6-6



Figure 6-7

ZQM1EL

Electronic molded case circuit breaker (leakage type)

◇ Circuit breaker alarm: the circuit breaker general alarm is on, and the overvoltage, undervoltage, phase loss, overload, short circuit delay and other functions are set to alarm. If the corresponding fault occurs, the circuit breaker will display the alarm prompt, as shown in Figure 6-8, 6-9, 6-10 is overvoltage, undervoltage, phase loss alarm. At this time, if the audible and visual alarm function is on, the LCD backlight will light up.

Phase A overvoltage
:287V
Voltage threshold
:275V
Function warning....
2020-04-18 08:56:34

Figure6-8

Phase A undervoltage
:164V
Voltage threshold
:165V
Function warning....
2020-04-18 08:56:45

Figure6-9

Phase C failure
:0V
Voltage threshold
:100V
Function warning....
2020-04-18 08:56:55

Figure6-10

◇ Overload alarm. When the current current value of any phase exceeds 1.3 times of the rated current value, the circuit breaker will automatically display the alarm parameters, and the overload display is shown in Figure 6-11.

Please
Opening manually
switch on
Type : Overload
Parameter : 330A
Phase difference : A
2020-04-18 09:50:20

Figure 6-11

◆ Menu operation instructions

◇ 【Return】 : restore to the normal operation state of the system; Exit the setting and inquiry functions and restore to the rotating display state (when the circuit breaker is in the tripping state, restore to the stop display state).

◇ Function setting: press the 【Menu】 key to open the menu list, select the "Function setting" option, and then press the 【Menu】 key to open the function setting list, as shown in Figure 6-12. Each function item can be switched through 【Shift】 or 【Increment】 ; Press 【Menu】 to select the function item, 【Shift】 or 【Increment】 to select the required function, and press 【Menu】 to confirm saving.

► 0.Residual current protection: Start using
1.Automatic fixed gear : Close
2.Off sudden change protection : Close
3.Special wave protection : Close

Figure 6-12

Please enter password:
0000

Figure 6-13

► Rated residual current:
0500mA
No drive time:200ms
Sudden change threshold:50ms
Rated current:250A

Figure 6-14

◇ Parameter setting: select the "Parameter setting" option in the main menu list, and press the 【Menu】 key to open the password verification interface, as shown in Figure 6-10. After entering the interface correctly (the default password is 9009), press the 【Menu】 key to open the parameter setting list, as shown in Figure 6-11; As described above, the parameters can be modified through the combination of 【Menu】 , 【Shift】 and 【Increment】 keys. If you give up modifying parameters, press 【Return】 to return to the menu interface.

◇ Gate position information query: select the "gate position information" option in the main menu list, press the 【Menu】 key to open the gate position information data, and use the 【Shift】 or 【Increment】 key to query the last 10 gate position change data.

ZQM1EL Electronic molded case circuit breaker (leakage type)

Gate position information of the last
01 times: closing - opening
Type : overload
Parameter : 330A Phase difference:A
2020-04-18 10:20:20

Figure 6-15

Gate position information of the last
02 times: opening-closing
Type :Manual closing
Parameter :none Phase difference :none
2020-04-14 10:16:01

Figure 6-16

- ◇ Fault Times Query: Select the "Fault Times" option in the main menu list, and press the [Menu] key to open the fault times list, and query the total trip times and blocking trip times locking trip times and other data item information.
- ◇ In the rotating display state, press the [Increment] and [Return] keys at the same time, enter the password (default password: 9009), the password verification passes, and enter the data clearing interface, as shown in Figure 6-17. Press the [Menu] key to clear all data and return to the main menu.

Data clearance?

Figure 6-17

- ◇ Description of external terminal:
External wiring terminal: 1/2 pin is 485 communication B/A, 3 and 4 pins are external telecontrol breaking, short circuit 3 and 4 pins will trip the circuit breaker. (This function needs to turn on the [Remote breaking] option in the function setting option), and pin 7 is the working voltage N-line connection. External terminals are shown in Figure 6-18 below.

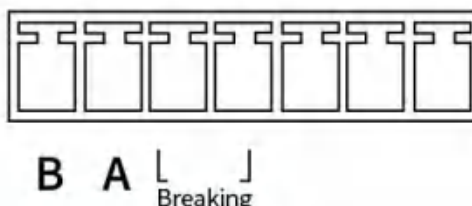
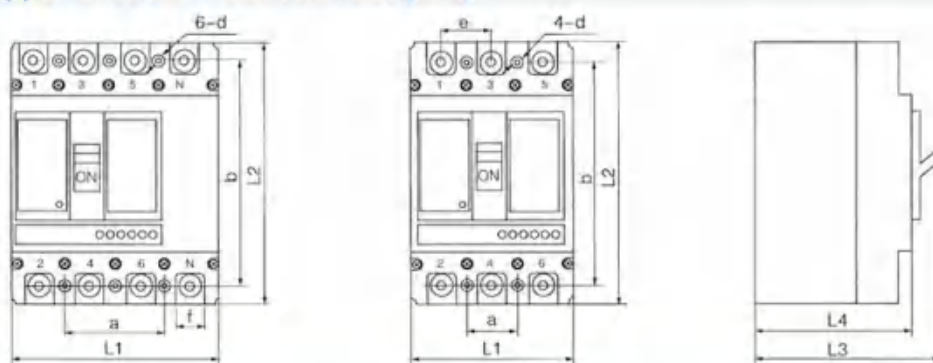


Figure 6-18

Product appearance and installation size (mm)



Model specification	Number of poles (p)	Overall dimension (mm)				Installation dimension (mm)			Center distance of copper bar	Size of inlet and outlet copper bar
		L1	L2	L3	L4	a	b	d		
ZQM1EL-250	3	107	165	110	90	35	126	Φ4.5	37	23
	4	142	165	110	90	70	126	Φ4.5	37	23
ZQM1EL-400	3	150	257	146	108	50	194	Φ7	48	31
	4	198	257	146	108	94	194	Φ7	48	31
ZQM1EL-800	3	210	280	155	116	70	243	Φ7	69	44
	4	280	280	155	116	140	243	Φ7	69	44



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- Intelligent universal circuit breaker
- Molded case circuit breaker
- Intelligent molded case circuit breaker
- Leakage molded case circuit breaker
- Miniature circuit breaker**
- Self-resetting overvoltage and undervoltage
- dual power switch
- Load disconnecter
- Contactor thermal relay
- Branch/busbar

ZQB1

High breaking miniature circuit breaker



ZQB1 High breaking miniature circuit breaker



Product overview

- ◇ ZQB1 series high breaking miniature circuit breaker is applicable to lines with AC 50/60HZ, rated voltage 230/400V and rated current up to 63A for overload, short circuit and personal safety and equipment leakage protection.
- ◇ In addition, the electronic circuit design is advanced, the unique filtering device and chip mounting process, and the high anti-interference performance can effectively prevent the misoperation caused by the instantaneous voltage change and surge current. The circuit breaker is applicable to industrial, commercial, high-rise and civil buildings and similar places, and can also be used for infrequent on-off operations. Suitable for non-professional personnel.
- ◇ External accessories: alarm, auxiliary, shunt+auxiliary, undervoltage and overvoltage.
- ◇ Product function: overload and short circuit protection.
- ◇ Product use: for power distribution and lighting, and for motor protection.
- ◇ Number of product poles: 1, 2, 3, 4.
- ◇ Breaking capacity: 6000A.
- ◇ Product current: 1, 3, 6, 10, 16, 20, 25, 32, 40, 50, 63A.
- ◇ Executive standards: IEC 60898-1, IEC 1259-1, GB/T10963.1GB/T16917.1.

Model and its meaning

ZQ B 1 - 63 / C 16 / 2P

- Number of poles
- Operating current (optional)
- Tripping characteristic
- Shell frame grade current
- Design serial number
- Product model
- Name of the company

Technical parameter

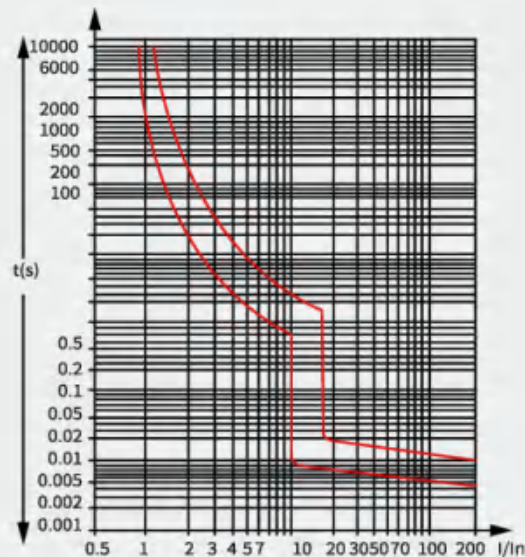
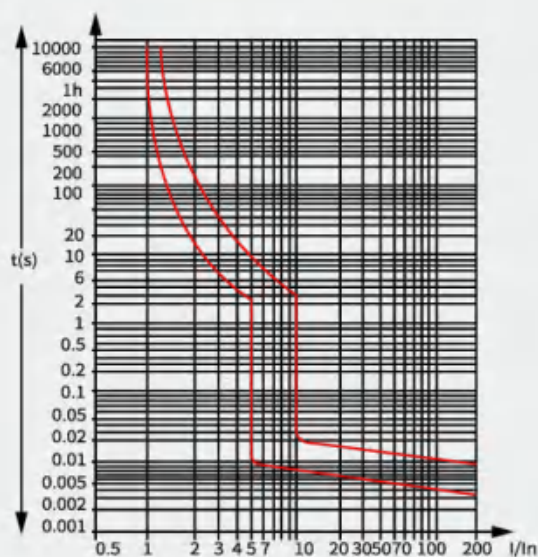
Rated current of shell frame grade $I_{nm}(A)$	Number of poles	Rated voltage (V)	Rated voltage (V)	Rated current (A)	Rated operating short circuit breaking capability I_{cs}		Rated limit short circuit breaking capacity I_{cu}	
					Breaking current(A)	$\cos\phi$	Breaking current(A)	$\cos\phi$
63	1	50 or 60	230、400	1、3	6000	0.7	6000	0.7
	2		230、400	6、10				
	3		400	16、20				
	4		400	25、32 40、50 63				

Serial number	Test current	Initial state	Tripping or non-tripping time limit	Expected result	Remarks
a	$1.13I_n$	Cold state *	$t \geq 1h (\leq 63A)$	No tripping	
b	$1.45I_n$	Right after test A	$t < 1h (\leq 63A)$	Tripping	The current rises steadily to the specified value within 5s.
c	$2.55I_n$	Cold state *	$1s < t < 60s (I_n \leq 32A)$	Tripping	
			$1s < t < 120s (I_n > 32A)$		
d	$3I_n$	Cold state *	$t \geq 0.1s$	Tripping	B
	$5I_n$				C
	$10I_n$				D
e	$5I_n$	Cold state *	$t < 0.1s$	Tripping	B
	$10I_n$				C
	$15I_n$				D

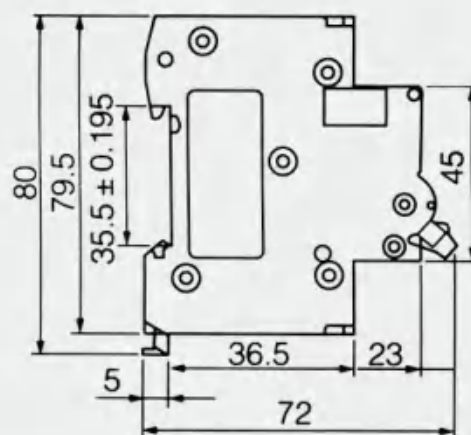
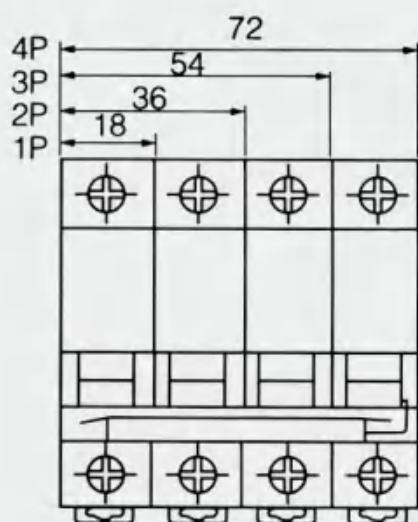


ZQB1
High breaking miniature circuit breaker

Tripping characteristic curve



Outline and installation dimensions





ZQB1LE High-breaking small leakage circuit breaker

Product overview



◇ ZQB1LE high breaking miniature circuit breaker has the characteristics of advanced structure, reliable performance, high breaking capacity, beautiful and compact appearance, etc. The shell and three parts are made of impact-resistant and high flame retardant materials. It is suitable for places with AC 50Hz or 60Hz, rated working voltage of 415V and below and rated current of 6A to 63A. It is used for lighting of main office buildings, residences and similar buildings, overload, short circuit and leakage protection of power distribution lines and equipment, and can also be used for infrequent line switching under normal circumstances.

Model and its meaning



ZQ B 1 LE - 63 / C 16 / 2P OF + 30mA

Rated residual operating current value

Left attachment

Number of poles

Operating current (optional)

Tripping characteristic

Shell frame grade current

Leakage circuit breaker

Design serial number

Product model

Name of the company



Trait

Project \ Model	ZQB1LE- □ /1P	ZQB1LE- □ /2P	ZQB1LE- □ /3P	ZQB1LE- □ /3P+N	ZQB1LE- □ 4P
Number of poles	Unipolar two-wire	Two -pole two -wire	Three-pole three-wire	Three-pole four-wire	Four-pole four-wire
Rated voltage Un(V)	230		230/400		
Rated current of shell frame grade Inm(A)	63				
Rated current I(A)	1.3.6.10.16.20.25.32.40.50.63				
Rated leakage action current I△n(A)	0.03/0.05/0.1				
Rated leakage non-action current I△n(A)	1/2 I△n				
Breaking time (s)	≤ 0.1				
Rated short circuit breaking capacity (A)(COSΦ=0.7)	6000				
Mechanical and electrical life (times)	> 20000				
Action characteristics of tripping release	Delay	1.13In ≥ 1h without tripping			
		1.45In < tripping			
		2.55In 1-120s tripping (> 32A) 1-60s release 1 ≤ 32A			
	Instantaneous	5In < 0.1s without tripping			
		10In < 0.1stripping			

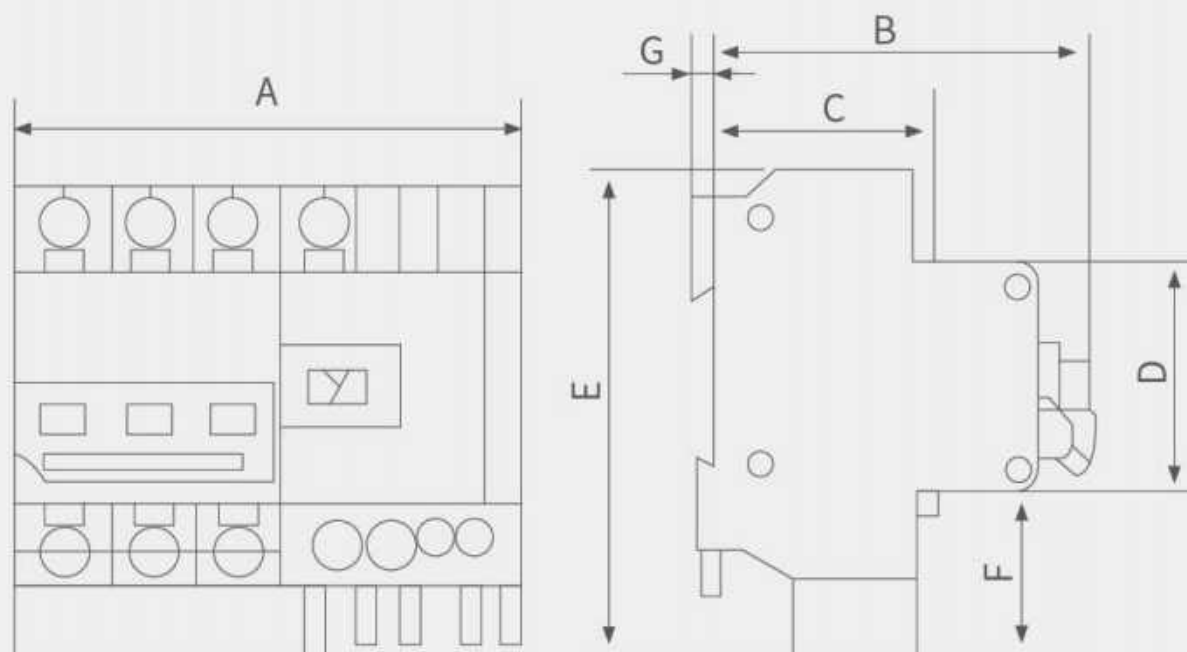


**ZQB1LE**
High-breaking small leakage circuit breaker**Outline and installation dimensions**

TH35-7.5 mounting rail is adopted for product installation, and its appearance and mounting dimensions (see chart).

Model	Overall dimensions							
	A(small)	A(large)	B	C	D	E	F	G
ZQB1LE-63/1P	45	54	72	39	45	95	32	5.5
ZQB1LE-63/2P	63	72	72	39	45	95	32	5.5
ZQB1LE-63/3P	90	103	72	39	45	95	32	5.5
ZQB1LE-63/3P+N	99	116	72	39	45	95	32	5.5
ZQB1LE-63/4P	118	134	72	39	45	95	32	5.5

Note "A (small)" means that the leakage shell is a small shell and "A (large)" means that the leakage shell is a big shell.





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Intelligent universal circuit breaker

Molded case circuit breaker

Intelligent molded case circuit breaker

Leakage molded case circuit breaker

Miniature circuit breaker

Self-resetting overvoltage and undervoltage

dual power switch

Load disconnecter

Contactor thermal relay

Branch/busbar

ZQNC-125

High breaking small (leakage) circuit breaker



ZQNC-125

High breaking miniature circuit breaker



Product overview

- ◇ ZQNC-125 high breaking small (leakage) circuit breaker is used to protect the short circuit and overload of the line. It is applicable to the lighting distribution system and the motor distribution system. Beautiful and compact appearance, light weight, excellent performance, high reliable breaking capacity, rapid tripping, high flame retardant and impact resistant plastic used for guide rail installation shell and parts, long service life, mainly used for overload, short circuit and protection of AC 50Hz/60Hz single-pole 230V, two-pole, three-pole and four-pole 400V lines. At the same time, electrical devices and lighting lines can be switched on and off infrequently under normal conditions.
- ◇ Comply with IEC60898-1, IEC1259-1 GB/T 10963.1 and GB/T 16917.1.



Model meaning

ZQ	NC	125	/	C	125	/	2P	/	OF	+	MN	AC230V	
													Voltage value of shunt release
													Enclosure
													Enclosure
													Number of poles
													Operating current (optional)
													Tripping characteristic
													Shell frame grade current
													Product model
													Name of the company

Note:

- ◇ Current shell frame grade $I_{nm} = 125$
- ◇ Tripping characteristics: Type C refers to lighting protection, and Type D refers to power protection.
- ◇ Rated current optional: 63/80/125/125A
- ◇ Number of poles 1P 2P 3P 4P
- ◇ Accessory Of auxiliary contact, SD alarm contact, note: only one of the accessories can be selected.
- ◇ Accessories: MN undervoltage release AC220V, MV overvoltage release AC220V, MN+MV undervoltage and overvoltage release AC220V MX+OF shunt release. Note 1: MN MV MN+MV can only be equipped with ZQNC -- 125-2P circuit breaker; 2. Only one of the accessories can be selected.
- ◇ The voltage value of shunt release is DC24V (DC24-48 universal) and AC230V (DC110-130/AC230-400 universal).



Technical parameter

- ◇ Main types: Type C is mainly used for lighting protection; Type D is mainly used for power protection.
- ◇ The rated current of the circuit breaker is 63A, 80A, 125A and 125A.
- ◇ The number of poles of circuit breaker is divided into: 1P 2P 3P 4P.
- ◇ The circuit breaker is embedded installation (can be installed on the mounting rail)
- ◇ The rated working voltage of the circuit breaker and its related rated short-circuit make-break capacity.

Rated current (A)	Rated short circuit breaking capacity			
	Number of poles	Rated voltage(V)	Breaking capacity(A)	Power factor
63, 80, 125, 125	1.2, 3.4	230/400	6000	0.45-0.50

- ◇ Overcurrent tripping characteristics

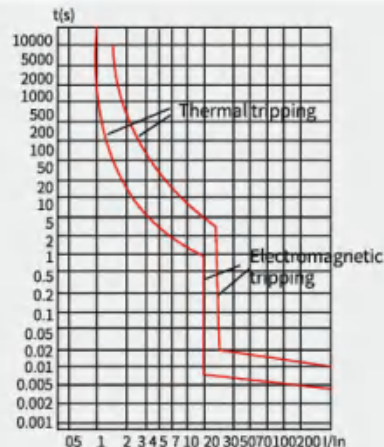
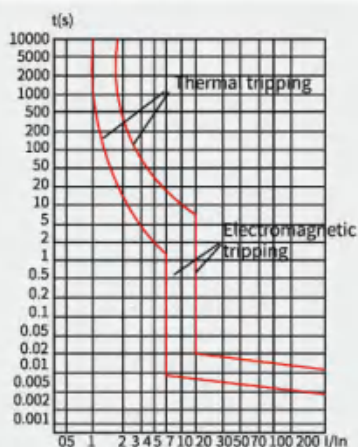
Ambient air temperature	I/In	Expected results of test time		I/In	Expected results of test time	Initial state
		In ≤ 63A	In > 63A		In ≤ 125A	
40±2℃	1.05(C)	No tripping within 1 hour	No tripping within 2 hours	1.0(D)	> 2h without tripping	Cold start
	1.30(C)	Tripping within hours	Tripping within 2 hours	1.2(D)	≤ 2h tripping	Hot start
	3.0(C)	Returnable time 3s	Returnable time 5s	7.2(D)	> 2s	Hot start
-5 ~ 45℃	8.0 ~ 12.0 (C)	< 0.2s tripping				Cold start
	10.0 ~ 14.0 (D)	< 0.2s tripping				



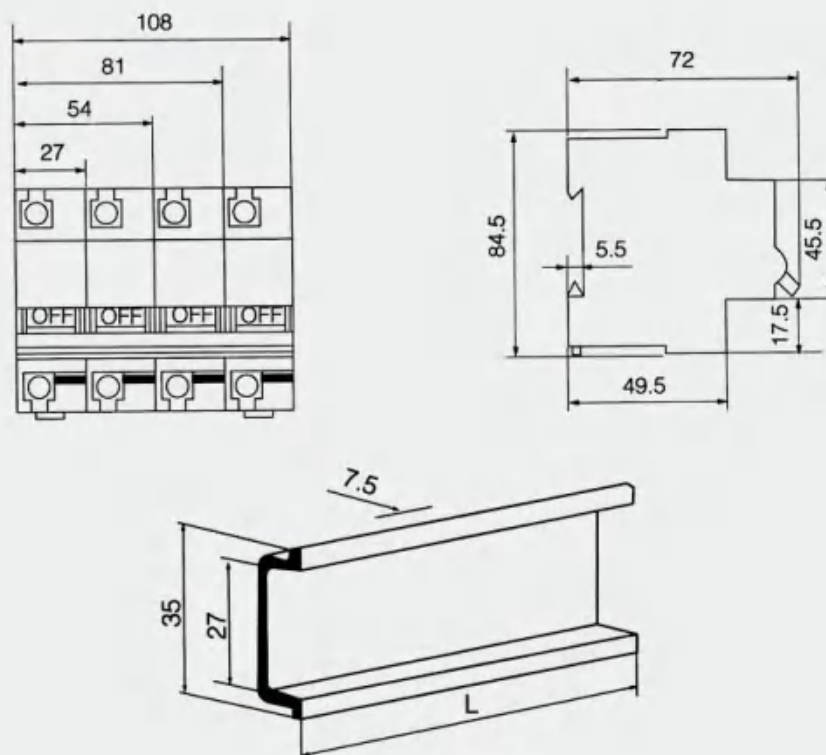
ZQNC-125 High breaking miniature circuit breaker

Trip characteristic curve

- ◇ The circuit breaker shall be able to withstand the 2500V power frequency withstand voltage test for 1 minute without flashover and breakdown after the damp and heat resistance
- ◇ Mechanical and electrical life The mechanical and electrical life of the circuit breaker is 12500 times, of which the electrical life is 1500 times;
- ◇ Tripping characteristic curve;
- ◇ Damp heat resistance class 2 (temperature 55 °C , relative temperature 95%);
- ◇ The connection terminal with clamp is used to fix the cable section up to 50mm.



Overall installation dimension





ZQNC-125 High breaking small (leakage) circuit breaker



Product overview

- ◇ ZQNCLE-125 series leakage circuit breaker is applicable to the lines with AC 50Hz (60Hz) rated voltage 230/400V rated current 63A to 125A. It has leakage overload, short circuit and other protection functions, and can also add overvoltage and protection functions according to the needs of users'. It is mainly used for the protection of building lighting and power distribution system.
- ◇ Comply with IEC1259-1 GB/T 16917.1.



型号及其含义

ZQ NC LE - 125 / C 16 / 2P OF + 30mA

Rated residual operating current value

Left attachment

Number of poles

Operating current (optional)

Tripping characteristic

Shell frame grade current

Leakage circuit breaker

Product model

Name of the company



Note

- ◇ Shell frame grade current $I_{nm}=125$
- ◇ Tripping characteristics: Type C refers to lighting protection; Type D refers to power protection;
- ◇ Optional rated current: 63A, 80A, 125A, 125A ;
- ◇ Number of poles: 1P+N, 2P, 3P, 3P+N, 4P;
- ◇ Left accessory of auxiliary contact and SD alarm contact. Note: Only one of the accessories can be selected;
- ◇ The rated residual action current value is 30mA (generally not written for regular orders), and filled in when ordering special specifications (to be confirmed in advance).



Product features

- ◇ Main types: Type C is mainly used for lighting protection; Type D is mainly used for power protection;
- ◇ The rated current of the circuit breaker is: 63A, 80A, 125A, 125A;
- ◇ The number of poles of circuit breaker is divided into: unipolar, bipolar, tripolar and quadrupole;
- ◇ This circuit breaker is embedded (can be installed on the mounting rail);
- ◇ The rated working voltage of the circuit breaker and its related rated short-circuit making and breaking capacity.



ZQNC-125

High breaking small (leakage) circuit breaker

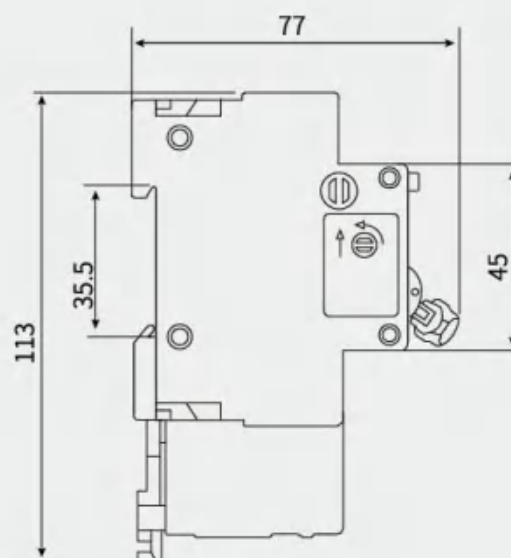
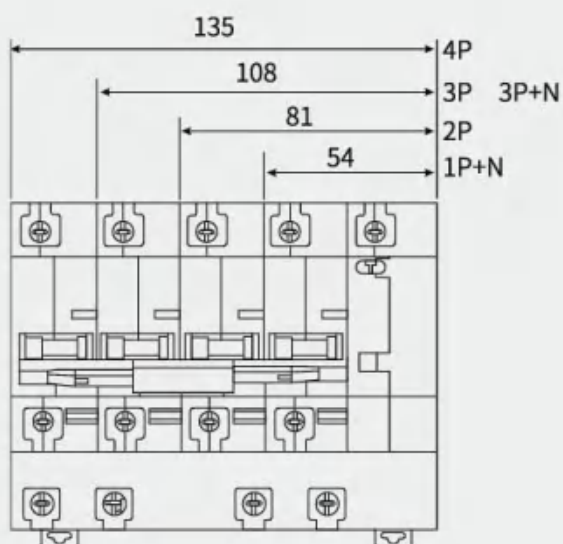
Technical parameter table

Rated voltage (V)	Rated current of shell frame grade (A)	Number of poles (P)	Rated current (A)	Rated short circuit breaking capacity		Rated short circuit breaking capacity	Rated leakage nonaction current I Δ no(mA)	Rated leakage action time (S)	Trip type
				The rated breaking capacity Icu(A)cos Φ					
230/400	125	1+N 2 3 3+N 4	63	6000	0.5	30 50 125 300	15 25 50 150	< 0.2	C
230/400	125		80	6000	0.5			< 0.2	C
230/400	125		125	6000	0.5			< 0.2	C
400	125		63	6000	0.5			< 0.2	D
230/400	125		80	6000	0.5			< 0.2	D
230/400	125		125	6000	0.5			< 0.2	D

Note

- ◇ Rated leakage action current: 30mA, 50mA, 125mA, 300mA.
- ◇ The wiring terminal with clamp can be used with 50mm or less hard cable.

Overall installation dimensions



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Intelligent universal circuit breaker

Molded case circuit breaker

Intelligent molded case circuit breaker

Leakage molded case circuit breaker

Miniature circuit breaker

Self-resetting overvoltage and undervoltage

dual power switch

Load disconnecter

Contactor thermal relay

Branch/busbar

ZQPNLE-32

High breaking small (leakage) circuit breaker



ZQPN High breaking miniature circuit breaker



Product overview

- ◇ ZQPN series miniature circuit breakers are applicable to the lines with AC 50/60Hz, rated voltage 230V, rated current 6A to 32A to protect the overload and short circuit of electrical lines. The exterior of ZQPN is the same as the ordinary single-pole ZQNC circuit breaker, while the interior is designed with a two-pole structure. One pole is protected, the other pole is unprotected, and the two poles are closed and disconnected at the same time, thus solving the various hidden dangers caused by the use of only one-pole switch at the single-phase end of civil residence, and really achieving safety and reliability. Therefore, it is the most ideal power distribution protector in the residential area at present.
- ◇ Comply with: IEC60898-1, GB/T10963.1

Model and its meaning

ZQ PN - 32 / C 16 / 1P + N

Number of poles
Operating current (optional)
Tripping characteristic
Shell frame grade current
Product model
Name of the company

Note:

- ◇ Tripping characteristics: Type C for lighting protection and Type D for power protection;
- ◇ Optional rated current: 6/10/16/20/25/32A;
- ◇ Number of poles: 1P+N.

Technical parameter

Rated current of shell frame grade	Number of poles	Rated voltage (V)	Rated current(A)	Rated short circuit breaking capacity		Mechanical life (times)
				Test line Prospective current	Power factor	
32A	1P+N	230	6.10.16.20.25.32	4500A	0.85-0.90	20000

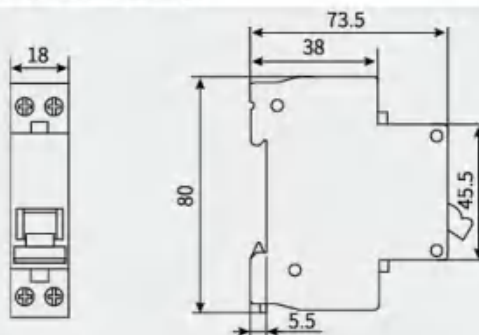
Note:

- ◇ Damp and heat resistance type: Type 2: temperature 55°C, relative humidity 95%;
- The connection terminal with clamp shall be used for connection, and the hard wire of 10mm² and below can be connected at the side.

Overcurrent tripping characteristic table

Test current (A)	Rated current (A)	Specified time	Expected results	Initial state	Remarks
1.13I _n	All values	t ≥ 1h	No tripping	Cold state	
1.45I _n	All values	t < 1h	Release	Hot condition	The current rises steadily to the specified value within 5s
2.55I _n	All values	1s < t < 60s	Release	Cold state	
5I _n	All values	t < 0.1s	No tripping	Cold state	Close the auxiliary switch and turn on the power.
10I _n	All values	t < 0.1s	Release	Cold state	Close the auxiliary switch and turn on the power.

TH35-25 mounting rail is used for installation.



ZQPNLE High breaking small (leakage) circuit breaker



Product overview

- ◇ ZQPNLE series leakage circuit breaker is applicable to single-phase residential lines with AC 50/60Hz, rated voltage 230V and rated current 32A. The exterior of ZQPNLE is the same as the ordinary single-pole ZQNC circuit breaker, while the interior is designed with a two-pole structure. One pole is protected, the other pole is unprotected, and the two poles are closed and disconnected at the same time, thus solving various hidden dangers caused by the use of only one-pole switch at the single-phase end of civil residence, and truly achieving safety and reliability. Therefore, it is the most ideal power distribution protector in the residential area at present.
- ◇ Comply with: IEC1259-1, GB/T 16917.1.

Model meaning

ZQ PN LE - 32 / C 16 / 1P+N

Number of poles
Optional rated current
Tripping characteristic
Shell frame grade current
Leakage circuit breaker
Product model
Name of the company

Note:

- ◇ Tripping characteristics: Type C refers to lighting protection, and Type D refers to power protection.
- ◇ Optional rated current: 6/10/16/20/25/32A
- ◇ Number of poles: 1p+n.

Technical parameter

Rated current of shell frame grade	Number of poles	Rated voltage (V)	Rated current(A)	Rated short circuit breaking capacity		Mechanical life (times)
				Test line Prospective current	Power factor	
32A	1P+N	230	6.10.16.20.25.32	4500A	0.85-0.90	20000

Note:

- ◇ Damp and heat resistance type: Type 2: the temperature 55°C, the relative humidity 95%;
- ◇ The connection terminal with clamp shall be used for connection, and the hard wire of 10mm² and below can be connected at the side.

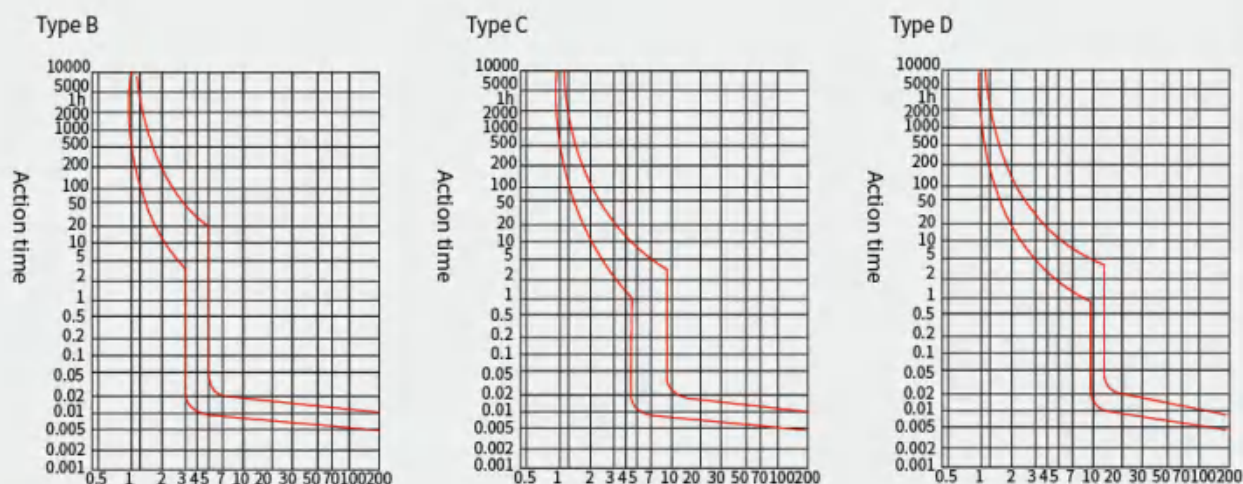
Overcurrent tripping characteristic table

Test current (A)	Rated current (A)	Specified time	Expected results	Initial state	Remarks
1.13I _n	All values	t ≥ 1h	No tripping	Cold state	
1.45I _n	All values	t < 1h	Release	Hot condition	The current rises steadily to the specified value within 5s
2.55I _n	All values	1s < t < 60s	Release	Cold state	
5I _n	All values	t < 0.1s	No tripping	Cold state	Close the auxiliary switch and turn on the power.
10I _n	All values	t < 0.1s	Release	Cold state	Close the auxiliary switch and turn on the power.

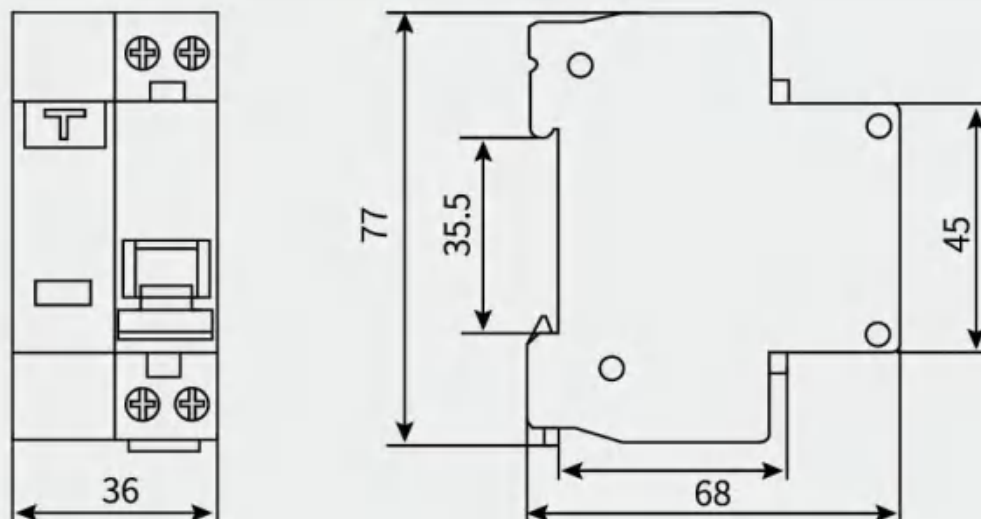


ZQPNLE
High breaking small (leakage) circuit breaker

Instantaneous action characteristic curve



Outline dimension installation drawing



- ◇ TH35-7.5 mounting rail is adopted for installation.
- ◇ Press the test button once a month to check the action of the leakage protection device.
- ◇ When the leakage protection device acts, there is a red mechanical indication on the front of the device.
- ◇ When the circuit breaker is re-closed, the protection device will automatically reset.



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Intelligent universal circuit breaker

Molded case circuit breaker

Intelligent molded case circuit breaker

Leakage molded case circuit breaker

Miniature circuit breaker

Self-resetting overvoltage and undervoltage

dual power switch

Load disconnecter

Contactors thermal relay

Branch/busbar

ZQGQ

Self-resetting overvoltage and undervoltage



ZQGQ Self-resetting overvoltage and undervoltage



Product overview

- ◇ ZQGQ self-reset overvoltage/undervoltage delay protector is a new generation product developed by our company according to market demand. The protector is reasonably designed and assembled with imported components and domestic famous brand components, and adopts advanced technology and manufacturing means. The product can quickly and reliably cut off the power supply and protect household appliances under high voltage impact and undervoltage. When the voltage returns to the normal value, it can automatically connect the circuit and restore the power supply after a delay. It can effectively protect the impact of electrical appliances being powered on at the moment of power supply. All functions are automatic, without the need for special personnel to operate, and double-light indication is selected.
- ◇ Power indicator: green.
- ◇ Protection indication: red.

Model meaning



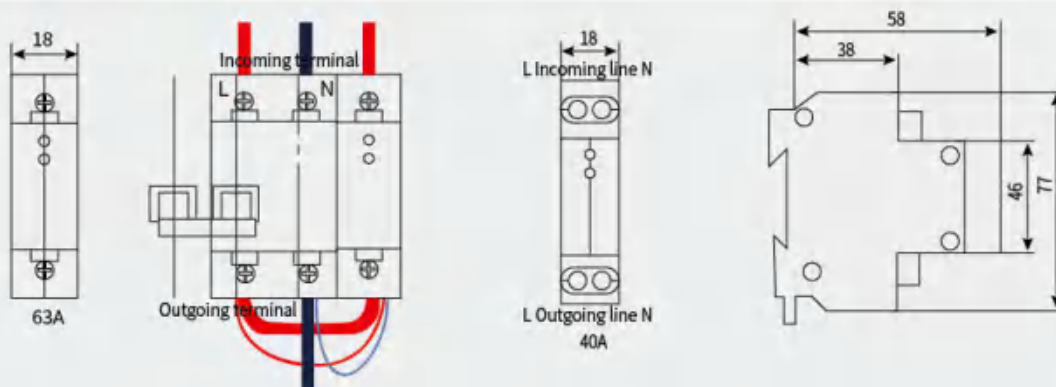
Main technical parameters

Specifications	Rated current In.A	Rated voltage Ue.V	Rated frequency f.H.Z	Overvoltage starting value V	Normal pressure recovery value V	Undervoltage starting value V
ZQGQ two-phase overvoltage and undervoltage	25、32 40、50	230AC	50	265±5	240~260	175±5
ZQGQ three-phase four-wire overvoltage+phase loss	63、80 100、125	400AC		460±15	420~440	300±15

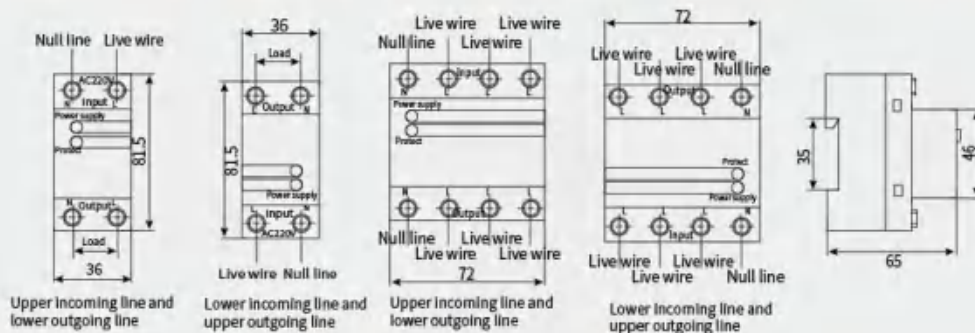
Specifications	Normal pressure recovery value V	Recovery delay time S	Self power consumption W	Mechanical (electrical) life
ZQGQ two-phase overvoltage and undervoltage	190±5	≤ 60s	< 1	100,000 times
ZQGQ three-phase overvoltage and undervoltage+ phase loss Three-phase four-wire overvoltage and undervoltage+phase loss	335±10		< 2	

ZQGQ Self-resetting overvoltage and undervoltage

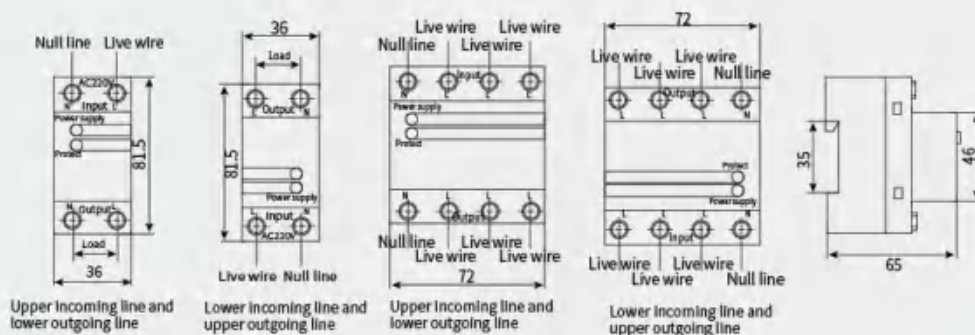
ZQGQ only occupies one position, and the installation dimension of self-resetting overvoltage and undervoltage protector



Installation dimension of ZQGQ-63 self-resetting overvoltage and undervoltage protector



Installation dimension of ZQGQ-125 self-resetting overvoltage and undervoltage protector



- ◇ See the figure above for the overall dimension (mm);
- ◇ Allowable operating temperature range: $-40^{\circ}\text{C} \sim +85^{\circ}\text{C}$;
- ◇ This product is TH35mm guide rail;
- ◇ The altitude shall not exceed 2000m;
- ◇ Relative air temperature $\leq 85\%$;



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Intelligent universal circuit breaker

Molded case circuit breaker

Intelligent molded case circuit breaker

Leakage molded case circuit breaker

Miniature circuit breaker

Self-resetting overvoltage and undervoltage

Dual power switch

Load disconnecter

Contactor thermal relay

Branch/busbar

ZQ2E

Dual power automatic switch





ZQ2E Dual power automatic switch



Product overview

- ◇ ZQ2E-63 dual-power automatic switching device (hereinafter referred to as switching switch) is applicable to dual-circuit power supply system with AC 50Hz or 60Hz rated working voltage of 400V and rated working current of 63A and below. Selectively switch between two power supplies as required.
- ◇ The product has short circuit, overload and undervoltage protection functions, as well as fire protection, double opening and output closing signal functions. It is especially suitable for the installation of lighting lines in office buildings, shopping malls, banks, stations, hospitals and high-rise buildings requiring fire protection requirements.
- ◇ Compliance standards: IEC60947-6-1, GB/T14048.11.

Model and meaning



Z Q 2 E - 63 II C S / 63A 4 Y C

- Switching mode optional
- Structural mode optional code
- Pole number optional code
- Rated current optional
- Function code
- Optional code for different purposes
- Function series
- Shell frame grade current
- CB level small micro-break (DZ47 type)
- Design serial number
- Product model
- Name of the company



Note

- ◇ Shell frame grade current: $I_{nm}=63$;
- ◇ Function series: basic type is not marked II represents new type;
- ◇ Optional codes for different purposes: C for lighting protection (not marked) and D for power protection;
- ◇ Function code: S is intelligent type, A is economic type (economic type "A" is not marked);
- ◇ Optional rated current: 6.10.16.20.25.32.40.50.63A;
- ◇ Optional code for number of poles: 3 represents tripolar and 4 represents quadrupole;
- ◇ Optional code of structure mode: Y represents integrated structure;
- ◇ Switching mode is optional: A refers to grid-grid and C refers to power terminal type.

Normal operating conditions

- ◇ The upper limit value of ambient air temperature shall not exceed $+40^{\circ}\text{C}$, the lower value shall not exceed -5°C , and the average value of 24h shall not exceed $+35^{\circ}\text{C}$.
- ◇ The altitude of the installation site shall not exceed 2000m.
- ◇ The relative humidity of the atmosphere is not more than 50% when the ambient air temperature is $+40^{\circ}\text{C}$. At a lower temperature, there can be a higher humidity. The monthly average minimum humidity in the wettest month is $+25^{\circ}\text{C}$, and the average maximum relative humidity is 90%. In addition, the condensation on the product surface due to humidity change is considered.
- ◇ The pollution level is class III.
- ◇ The operation site shall be free from strong vibration and impact, corrosive metal and harmful gas damaging insulation, serious dust, conductive particles and explosive hazardous substances, and strong electromagnetic interference.

ZQ2E Dual power automatic switch

Product features

- ◇ Reasonable structure, minimum volume, beautiful appearance, equipped with protective cover, more secure and reliable power supply.
- ◇ The protection function is complete, with short circuit, overload, lphase loss, undervoltage and other protection.
- ◇ The interface with EPS fire power supply and DC24V can be reliably and remotely split.
- ◇ Noise-free operation, energy saving and consumption reduction, convenient installation, simple operation, reliable and stable performance.

Main technical parameters

Product model	ZQ2E-63
Meet a criterion	IEC60947-6-1, GB/ T14048.11
Actuating circuit breaker	ZQB1-63
Current specification (A)	6,10,16,20,25,32,40,50,63
Rated operating voltage (Ue)	400V 50HZ
Rated insulation voltage (Ui)	400V
Rated impulse withstand voltage (Uimp)	4kV
Number of poles	3P,4P
Short circuit breaking capacity code	D
Rated short circuit making capacity (Icm)	7.65kA
Rated short circuit breaking capacity (Icn)	5kA
Life	6000 times
Usage category	AC-33iB
Electrical level	CB level
Protection grade	IP20
Protect	Overload protection/short circuit protection

product performance

The transfer switch is a complete set of two ZQB1-63 miniature circuit breakers, motors and mechanical rotating devices, and the two power supplies are detected by the controller. When the circuit is abnormal, the controller makes logical judgment on the detection results, and drives the operating mechanism to open or close according to the controller's instructions, thus ensuring the safe and reliable power supply to the load.

- ◇ Making and breaking capacity

Making and breaking capacity						
Applicable category	Test conditions of making and breaking capacity					
	I/Ie	U/Ue	Cos ϕ	Electrification time s	Cycle period min	Number of operation cycles
AC-33B	6.0	1.05	0.5	0.05	≤ 5	12

Note: AC-33B motor load or mixed load including motor and resistance load under infrequent operation

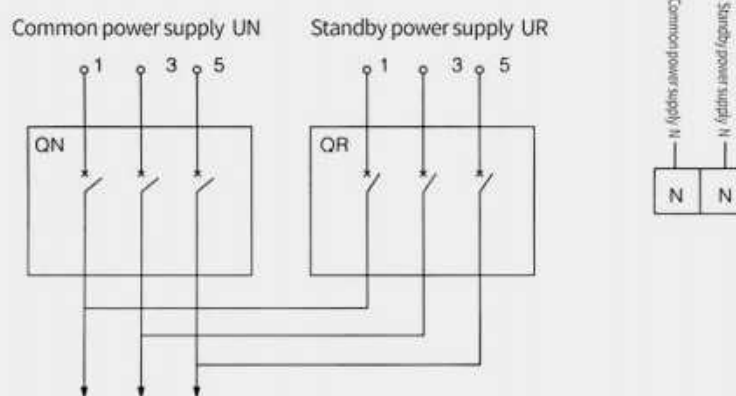
- ◇ Rated short circuit breaking capacity: 3kA
- ◇ Rated short circuit making capacity: 3kA
- ◇ Conversion time: 3s
- ◇ The control voltage of the transfer switch is AC230V
- ◇ The mechanical life of the transfer switch (common or standby transfer) is 3000 times, and the electrical life is 1500 times
- ◇ Rated insulation voltage: $U_i=500V$
- ◇ Operating current: 10A, 16A, 20A, 25A, 32A, 40A, 63A.
- ◇ Generally, the transfer switch has the function of auto-switching and auto-recovery, and the principle of common power supply priority. If automatic switching and self-recovery change-over switch is required for special occasions, the user and manufacturer shall negotiate to order.



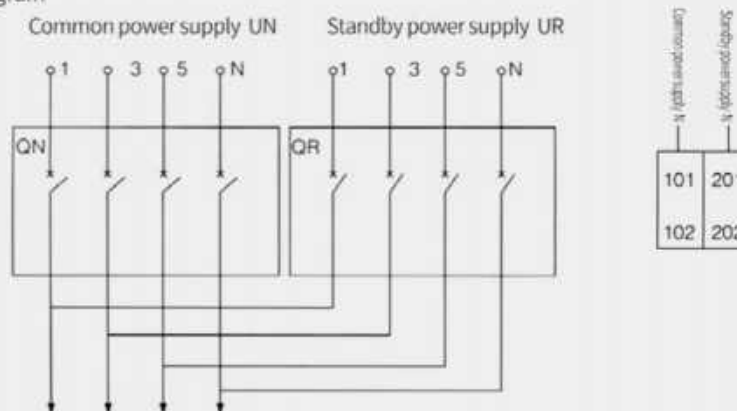
ZQ2E
Dual power automatic switch

External wiring diagram

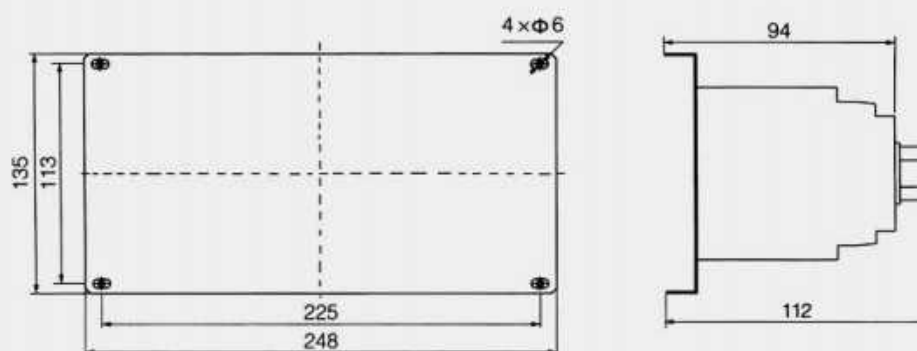
◇ 3P product wiring diagram



◇ 4P product wiring diagram



Overall and installation dimensions





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Self-resetting overvoltage and undervoltage

Dual power switch

Load disconnecter

Contactor thermal relay

Branch/busbar

ZQ2G

Dual power automatic switch





ZQ2G

Dual power automatic switch



Product overview

- ◇ ZQ2G automatic transfer switch (ATSE) is a combination of switch and logic control, without additional controller. The automatic transfer switch that truly realizes electromechanical integration has the functions of voltage detection, frequency detection, communication interface, electrical and mechanical interlock, and can realize automatic, electric remote and emergency manual control.
- ◇ The operation is realized by the logic control board to manage the operation of the motor and gearbox with various logic commands. The motor is equipped with a switch spring to store energy and an instantaneous release acceleration mechanism, which can quickly connect and disconnect the circuit breaker or conduct circuit conversion to achieve safe isolation through obvious visible state, greatly improving various electrical and mechanical properties.
- ◇ Comply with IEC60947-6-1, GB/T 14048.11.



Model and meaning

Z Q 2 G - □ - □ / □ □ □ □

Add intelligent function code

Y- integrated, K- split (with 485 communication)

R-auto-switch and auto-recovery, S-auto-switch and non-auto-recovery

Type I, type II and type III

Number of poles (3P, 4P)

Agreed heating current

Isolated type

Design serial number

Dual power automatic transfer switch

Enterprise code

Note

- ◇ Type I: fully automatic
- ◇ Type II: fully automatic, forced "0" remote control, with generator.
- ◇ Type III: phase loss detection protection, fully automatic, forced "0", remote control, with generator



Structure overview

- ◇ The overall design of ZQ2G automatic transfer switch is metal shell, small and firm. ZQ2G automatic transfer switch, the control part is made of metal shell, and the switch part is made of glass fiber unsaturated polyester resin shell, which has strong dielectric property, protective ability and reliable operation safety.
- ◇ The switch is applicable to the automatic conversion of the main power supply and standby power supply of the power supply system or the automatic conversion and safety isolation of two load equipment.
- ◇ The switch is beautiful, novel, simple, small and functional, which is the best choice of similar products.
- ◇ ZQ2G automatic transfer switch series products have passed the electromagnetic compatibility test.



Compliance with standards

- ◇ International standards:
IEC60947-1 (1998) Low-voltage switchgear and controlgear - Part 1: General rules.
IEC60947-3 (1999) Low-voltage switchgear and control equipment, switches, isolators, disconnectors, fuse combinations
IEC60947-6 (1999) Low-voltage switchgear and controlgear Multi-functional switch automatic transfer switchgear
- ◇ National standards
GB 14048.1-2002 General Rules for Low-voltage Switchgear and Control Equipment
GB 14048.3-2002 Low-voltage switchgear and controlgear, low-voltage switches, isolators, disconnectors and fuse assemblies
GB/T 14048.11-2002 Low-voltage Switchgear and Controlgear Multi-functional Apparatus Part 1: Automatic Transfer Switching Apparatus

ZQ2G Dual power automatic switch

Product features

- ◇ The technology of double-row compound contact, transverse pull mechanism, micro-motor pre-storage and micro-electronic control is used to basically realize zero flashover (without arc extinguishing cover);
- ◇ Reliable mechanical interlocking and electrical interlocking shall be adopted, and independent load disconnecter shall be adopted for the execution of non-elements, which is safe and reliable;
- ◇ Adopt zero-crossing technology, which can be forced to zero in case of emergency (cut off two power supplies at the same time) to meet the needs of fire linka.
- ◇ The switching of the load disconnecter is driven by a single motor, which is reliable, stable, noiseless and with low impact;
- ◇ The driver motor of the operator only passes the current at the moment when the load disconnecter is switched, and the steady state operation does not need to provide the working current, which saves energy significantly;
- ◇ The executive load disconnecter is equipped with mechanical interlocking device to ensure the reliability and non-interference of common and standby power supply;
- ◇ With obvious on-off position indication, padlock and other functions, reliably realize the isolation between power supply and load;
- ◇ Good safety performance, high degree of automation, high reliability and service life of more than 8000 times;
- ◇ Electromechanical integration design, accurate, flexible and smooth switch conversion, international advanced logic control technology, strong anti-interference ability and no external interference;
- ◇ With main power on, standby power off, main power off and standby power on; The main and standby power supplies are disconnected for three stable operations (I - 0 - II);
- ◇ It is convenient to install, and the control circuit is connected with plug-in terminals;
- ◇ Four operation functions: emergency manual operation, electric remote control operation, emergency disconnection operation in automatic control state, and automatic control operation.

Area of application

- ◇ ZQ2G series automatic conversion switch is mainly used for the load switching of AC 50Hz, rated voltage 380V, DC rated voltage 220V, rated current 16 to 3200A distribution or motor network with one main and one standby power supply or mutual standby power supply switching system as well as municipal power supply and generator set. At the same time, it can be used for infrequent connection and disconnection of circuit and line isolation.
- ◇ The products are widely used in power transmission and distribution systems and automation systems in important power supply places, such as fire fighting, hospitals, banks, high-rise buildings, etc., where power failure is not allowed.

Operational environment

- ◇ ZQ2G automatic transfer switch can work reliably under the following conditions:
 - a. The altitude shall not exceed 2000 meters;
 - b. The ambient temperature is not higher than 40 °C, not lower than - 5 °C, and the relative humidity is not more than 95%;
 - c. Environment without explosive dangerous medium;
 - d. No rain and snow attack environment;
 Note: If the ambient air temperature is expected to be higher than +40 °C or lower than -5°C ~ 45°C, the user shall explain to the manufacturer.

Intelligent performance

- ◇ Three stable working positions:
Normal closing: common closing, standby opening. Standby closing: common opening, standby closing. Double opening: common opening, standby opening.
- ◇ Two optional automatic working modes:
 - a. Automatic switching and self-recovery: when the standby power supply is closed and the common power supply is restored to normal, the switch will automatically switch to normal closing whether the standby power supply is normal or not.
 - b. Automatic switching and non-automatic recovery: when the standby power supply is closed and the common power supply is restored to normal, while the standby power supply is normal, the switch will not switch. Only when the standby power supply is abnormal, the switch will automatically switch to normal closing.
- ◇ Four conversion control modes:
 - a. Automatic control: The controller automatically switches to the appropriate working position according to the current voltage condition and the set working mode.
 - b. Manual control: When the power supply is normal, the switch can be switched to any working position by pressing the key.
 - c. Manual control: After turning the key to the manual position, the handle can be used for manual operation.
 - d. Remote control: switch the control switch to the required working position through remote programmable input signal or 485 communication interface.
- ◇ Product function: real-time monitoring and display of operating parameters, real-time switch position and alarm. Under-voltage, over-voltage and phase-loss protection function to prevent the fault power supply from supplying power to the load. Self-diagnosis and fault alarm function.
- ◇ Optional functions include: fire double alarm, automatic control of power generation, two sets of programmable signal output relays, power indication and communication.



ZQ2G intelligent automatic transfer switch

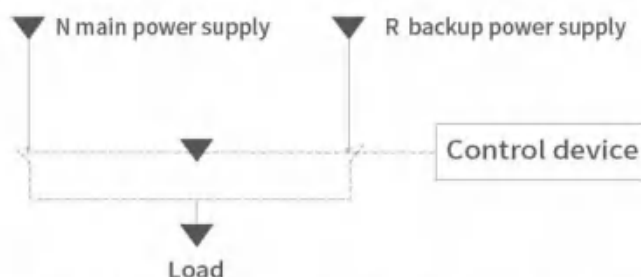


ZQ2G Dual power automatic switch

Control and operation

◇ ZQ2G-63A~3200A Automatic Transfer Switch Control and Operation

- The operation of the motor and gearbox directly installed in the switch is managed by the logic control board with different logic programs to ensure the position of the switch.
- The motor is a polychloroprene insulated damp heat type motor equipped with a safety device, which trips when the temperature exceeds 110 °C and the overcurrent state. After the fault disappears, it will be put into operation automatically. The reversible reduction gear adopts straight gear.



Application scope switching between normal and emergency application scope



Emergency manual operation: when the key is turned to the manual position, use the emergency operation handle to turn 90° at each position.



Disconnect 201 and 206 through the plug-in terminal 202~205 for remote electric control.



The key is in the automatic control state ZQ2G automatic switch and automatic recovery. The commonly used switch is preferred through the plug-in terminals 102 and 103. 202 and 204 are forced to return to the "0" position remotely.



Pull up the padlock with 1 to 3 locks: keep the position to prevent the emergency handle from being put on.



ZQ2G

Dual power automatic switch

Main technical performance parameters

◇ Electrical and Mechanical Properties of ZQ2g-100a ~ 630a Series Automatic Transfer Switches

Product model			ZQ2G										
			100A					160A		250A		630A	
Rated current			20A	40A	63A	80A	100A	125A	160A	200A	250A	400A	630A
Rated insulation voltage Ui(V)			500	500	500	500	500	500	500	500	500	500	500
Medium strength (v)			5000	5000	5000	5000	5000	5000	5000	5000	5000	8000	8000
Rated impulse withstand voltage UimpkV (installation category IV)			8	8	8	8	8	8	8	8	8	12	12
Rated working current Ie(A)	400V	AC-31	20	40	63	80	125	125	160	200	250	400	630
		AC-33	20	32	40	63	80	125	160	200	250	340	536
		AC-35	20	40	63	80	125	125	160	200	250	400	630
	220V	DC-31	20	40	63	80	125	125	160	200	250	400	630
			20	32	40	63	80	125	125	160	200	315	500
		DC-35	20	40	63	80	125	125	160	200	250	400	500
Motor power P(400V)kW			10	20	25	30	32	63	80	125	132	220	280
The rated short-term withstand current ICW (Karms) is 0.1s/1s.			9/5	9/5	9/5	9/5	9/5	20/10	20/10	25/12	25/12	40/20	50/25
Rated sectioning capacity (A Rms) AC33 380V			160	320	500	640	800	1000	1000	1600	1600	3200	3200
Rated making capacity (A Rms) AC33 380V			200	400	630	800	1000	1250	1250	2000	2000	4000	4000
Rated short-circuit making capacity Icm (kA peak)			8	8	10	10	10	12	12	17	17	30	30
Mechanical life (number of cycles)			10000	10000	10000	10000	10000	10000	10000	10000	10000	5500	5500
Electrical life	CosΦ=0.65 AC33		1500	1500	1500	1500	1500	1000	1000	1000	1000	500	500
Conversion time	I -0- II or II -0- I(s)		0.5	0.5	0.5	0.5	0.5	1.0	1.0	1.1	1.1	1.2	1.2
	I -0 or II -0(s)		0.3	03	0.3	0.3	0.3	0.6	0.6	0.7	0.7	0.8	0.8
Electrical control energy consumption	24V(DC)(W)		50	50	50	50	50	75	75	75	75	90	90
	220V(AC)(W)		50	50	50	50	50	75	75	75	75	90	90
Operating torque (Nm)			15	15	15	15	15	22	22	30	30	45	45



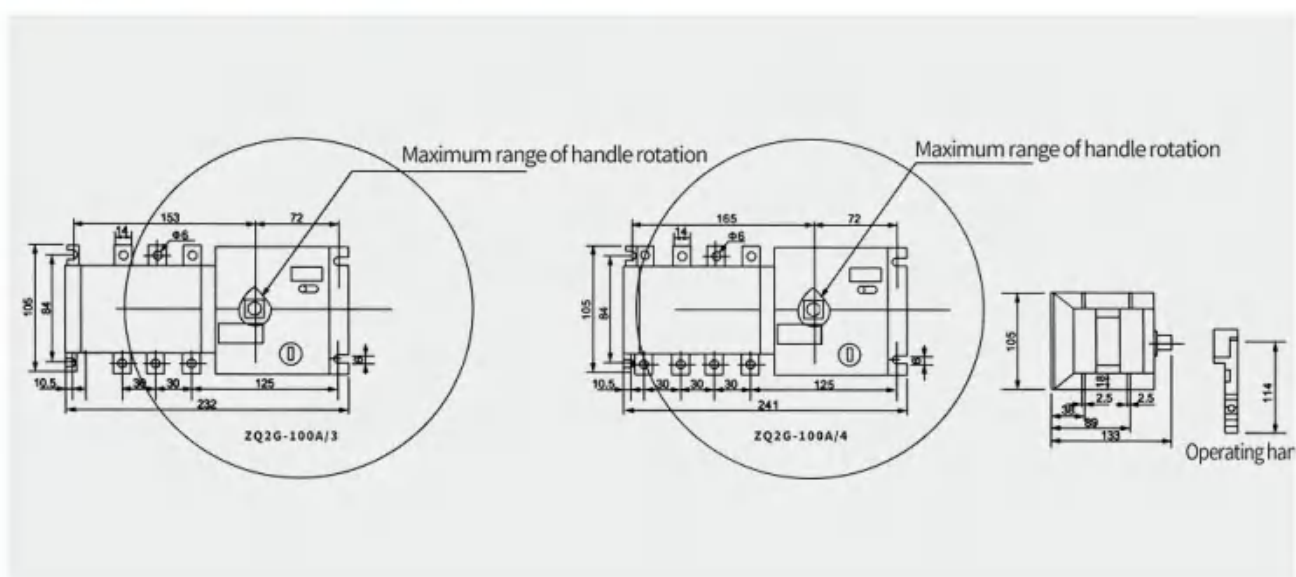
ZQ2G Dual power automatic switch

Main technical performance parameters

◇ Electrical and mechanical properties of ZQ2G-800A~3200A series automatic transfer switch

Product model			ZQ2G					
			800A	1000A	1250A	1600A	2000A	2500A
Rated insulation voltage Ui(V)			1000V					
Rated impulse withstand voltage Uimp kV			12KV					
Rated working voltage Ui(V)			AC440V					
Rated working current Ie(A)	AC-31	800	1000	1250	1600	2000	2500	3200
	AC-33	800	1000	1000	1000	1250	1250	1250
	AC-35	800	1000	1000	1000	2000	2000	2500
Rated making capacity			10Ie					
Rated breaking capacity			100			120	80	
Rated short-term withstand current			26KA	50KA				55KA
Conversion time I -0- II or II -0- I (s)			1.2s				2.4S	
Control power supply voltage			DC24V,48V,110V, AC220V					
Motor energy consumption	Rated control voltage AC220V	Start-up	400W	400W			600W	
		Normal	90W	98W			120W	

ZQ2G-100A outline and Installation Dimensions

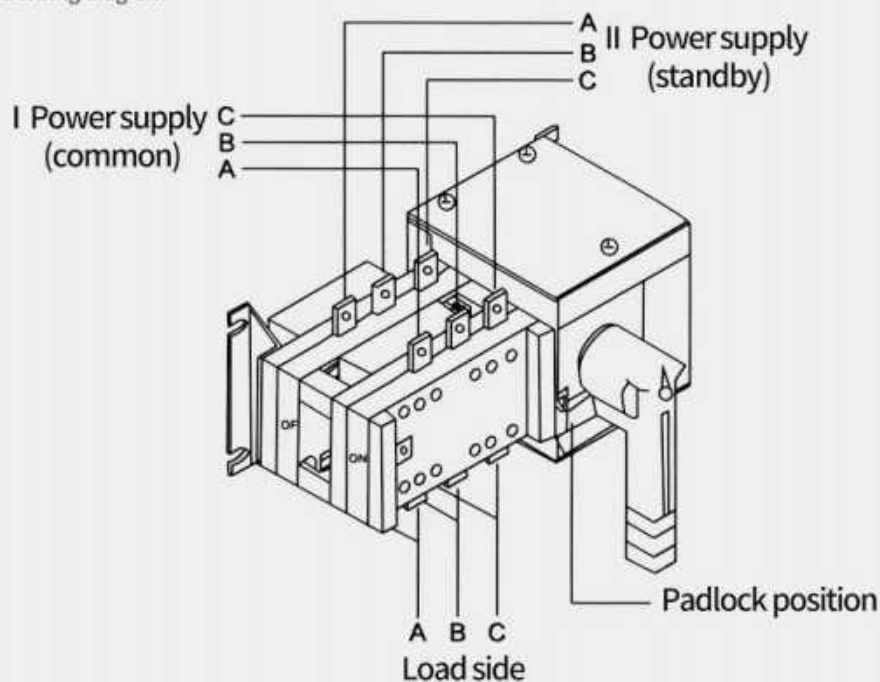




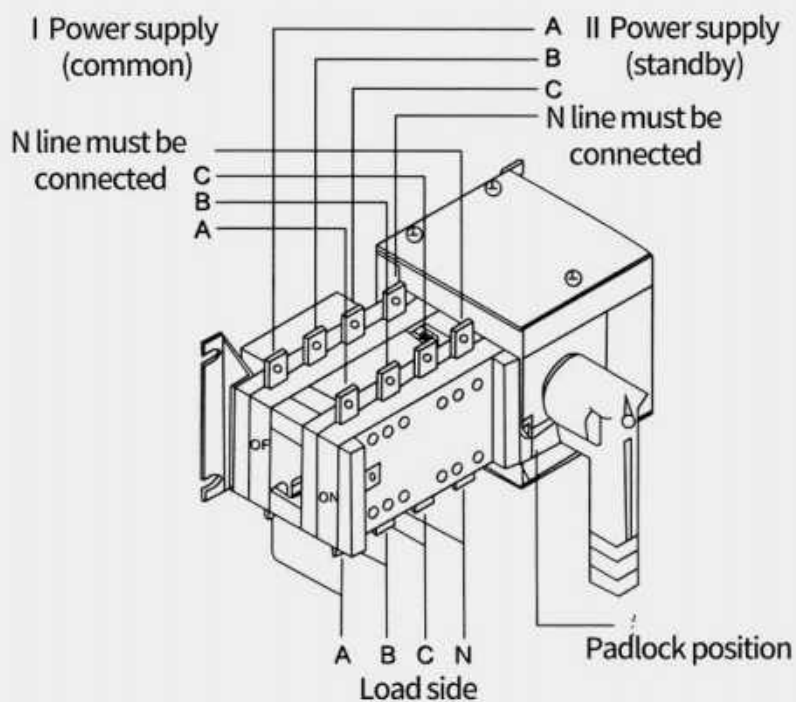
ZQ2G
Dual power automatic switch

Wiring diagram

◇ ZQ2G-125A/3 wiring diagram



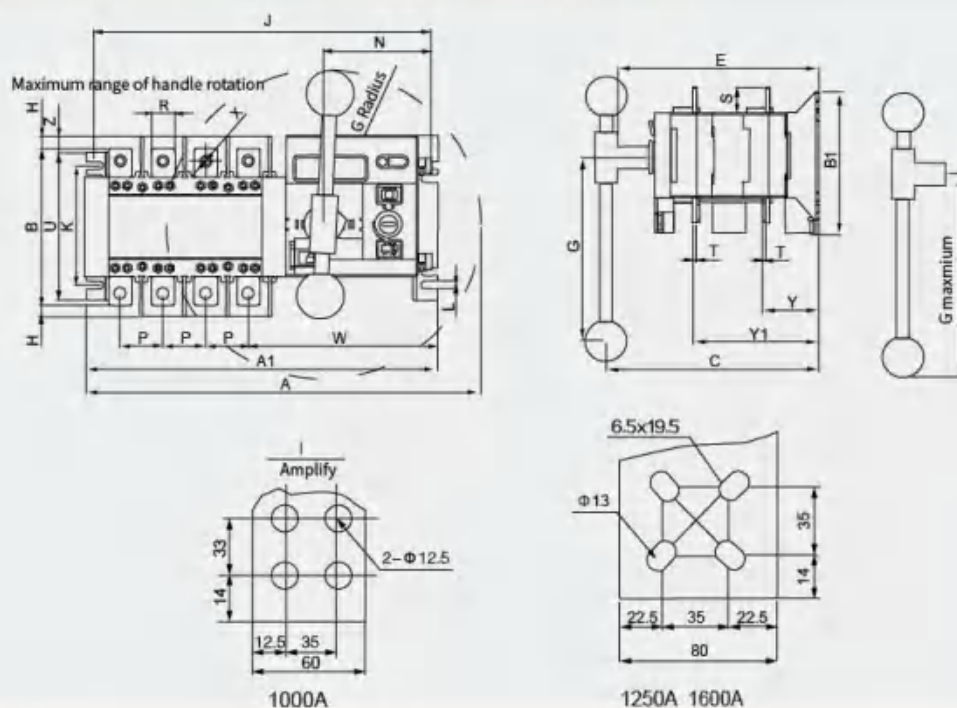
◇ ZQ2G-125A/4 wiring diagram



ZQ2G

Dual power automatic switch

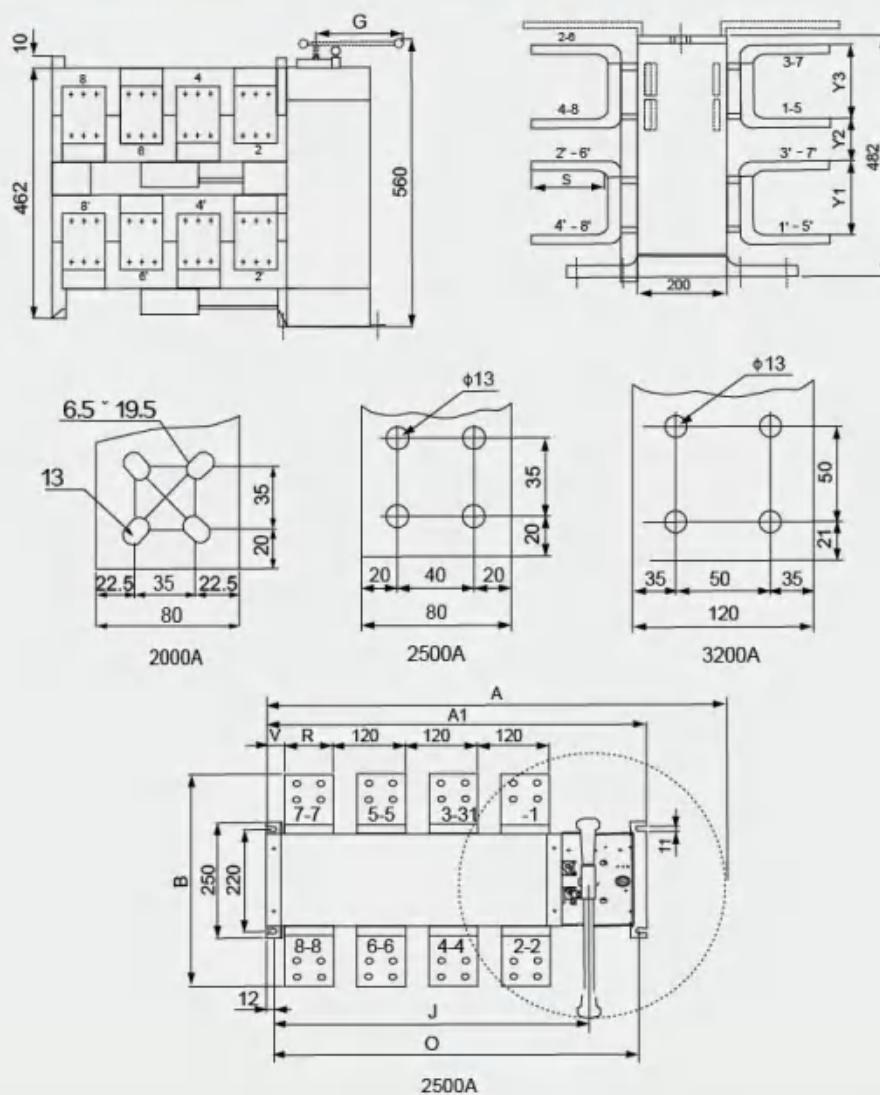
Outline and installation dimensions of ZQ2G-160A~1600A



Specifications	Overall size							Switch installation									Connection terminal			
In	A	A1	B	B1	C	E	G	J	K	L	N	P	R	S	T	U	W	ΦX	Y	Y1
125A/3	292	267	146	142	230	193	145	251	102	7	91	36	20	25	3.5	126	158	9	57	127
125A/4	322	300	146	142	230	193	145	284	102	7	91	36	20	25	3.5	126	158	9	57	127
160A/3	292	267	146	142	230	193	145	251	102	7	91	36	20	25	3.5	126	158	9	57	127
160A/4	322	300	146	142	230	193	145	284	102	7	91	36	20	25	3.5	126	158	9	57	127
250A/3	356	305	179	142	230	193	145	287	102	7	91	50	25	30	3.5	135	168	11	58	130
250A/4	406	360	179	142	230	193	145	343	102	7	91	50	25	30	3.5	135	168	11	58	130
400A/3	487	375	245	220	274	263	189	356	180	9	93	65	32	39	5	220	203	11	82	186
400A/4	552	433	245	220	274	263	189	416	180	9	93	65	32	39	5	220	203	11	82	186
630A/3	487	375	265	220	274	263	189	356	180	9	93	65	40	49	5	220	203	11	82	186
630A/4	552	433	265	220	274	263	189	416	180	9	93	65	40	49	5	220	203	11	82	186
800A/3	670	515	353	250	321	306	443	495	220	11	87	120	60	54.5	8	250	207	13	107	240
800A/4	760	635	353	250	321	306	443	616	220	11	87	120	60	54.5	8	250	207	13	107	240
1000A/3	670	515	353	250	321	306	443	495	220	11	87	120	60	54.5	8	250	207	13	107	240
1000A/4	760	635	353	250	321	306	443	616	220	11	87	120	60	54.5	8	250	207	13	107	240
1250A/3	670	515	367	250	321	306	443	495	220	11	87	120	80	68	8	250	207	13	108	240
1250A/4	760	636	367	250	321	306	443	616	220	11	87	120	80	68	8	250	207	13	108	240
1600A/3	670	515	370	250	321	306	443	495	220	11	87	120	80	69	10	250	207	13	108	240
1600A/4	760	636	370	250	321	306	443	616	220	11	87	120	80	69	10	250	207	13	108	240

ZQ2G
Dual power automatic switch

Outline and installation dimensions of ZQ2G-2000A~3200A



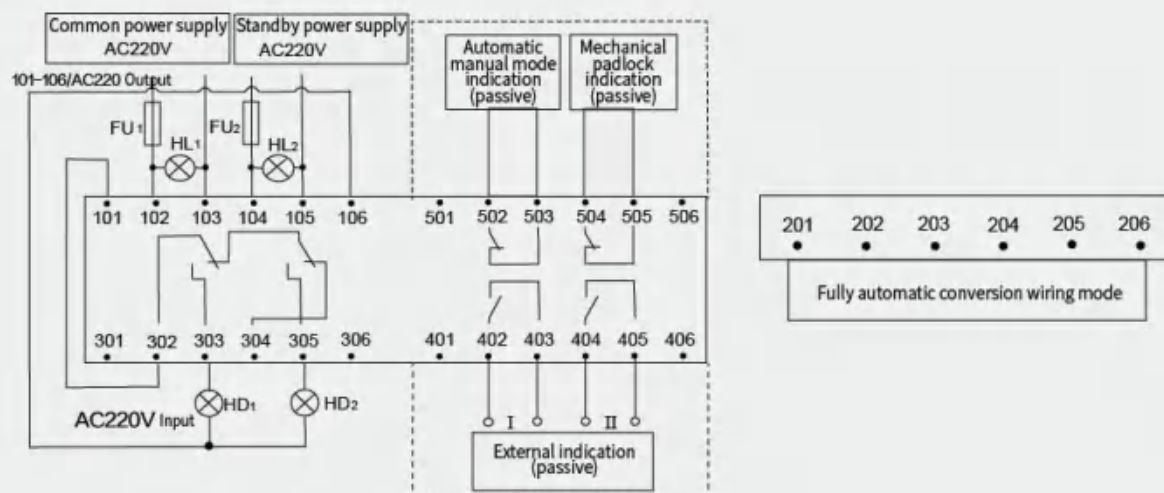
Specifications	Overall size						Switch installation										Connection terminal			
In	A	A1	B	C	E	G	J	K	L	N	P	R	S	T	U	V	Y	Y1	Y2	Y3
2000A/3	680	525	405	480	467	447	613	215	12	84.5	120	80	76	10	244	13	105	87	125	88
2000A/4	800	646	405	480	467	447	613	215	12	84.5	120	80	76	10	244	13	105	87	125	88
2500A/3	680	525	427	480	467	447	613	215	12	84.5	120	80	80	15	244	13	98	100	116	100
2500A/4	800	646	427	480	467	447	613	215	12	84.5	120	80	80	15	244	13	98	100	116	100
3200A/3	680	525	458	480	467	447	613	215	12	84.5	120	120	95	15	244	13	98	107	109	106
3200A/4	800	646	458	480	467	447	613	215	12	84.5	120	120	95	15	244	13	98	107	109	106



ZQ2G Dual power automatic switch

Connection mode

◆ Fully automatic wiring mode (suitable for rated current of 160A~3200A)



HL1 is the power indication of common power supply;
HL2 is the power indication of standby power supply;
HD1 is a common power input indicator
HD2 is a common standby power input indicator

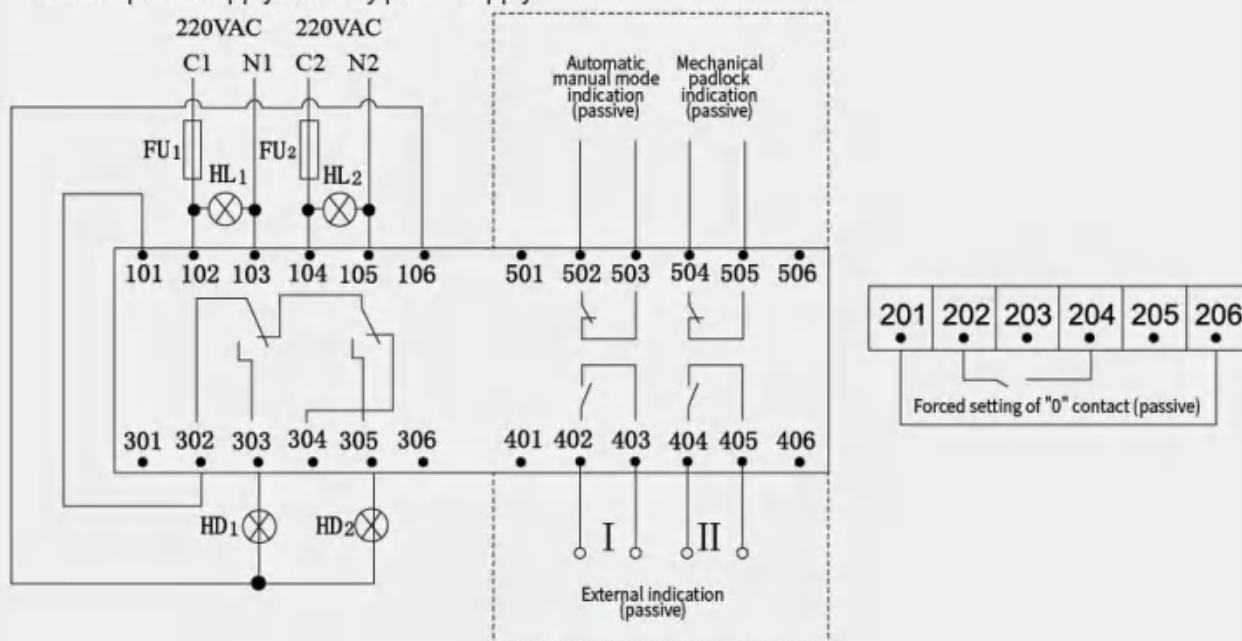
The new FU1/FU2 is 2A fuse.

101~106, 201~206 and 301~306 are switch terminals.

401 ~ 406, 501 ~ 506 switch terminals above 1000A can be selected.

◆ 100~3200 automatic+forced "0" (both power supplies are disconnected) wiring mode.

Common power supply Standby power supply

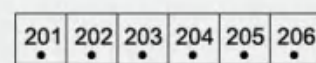
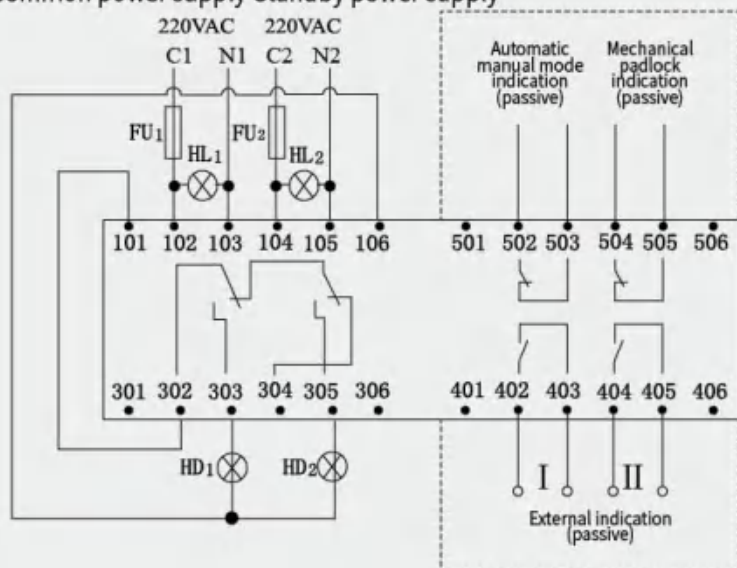


ZQ2G
Dual power automatic switch

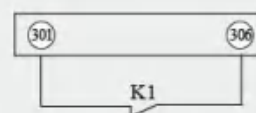
Connection mode

◆ 100~3200 automatic+generator signal output wiring mode

Common power supply Standby power supply

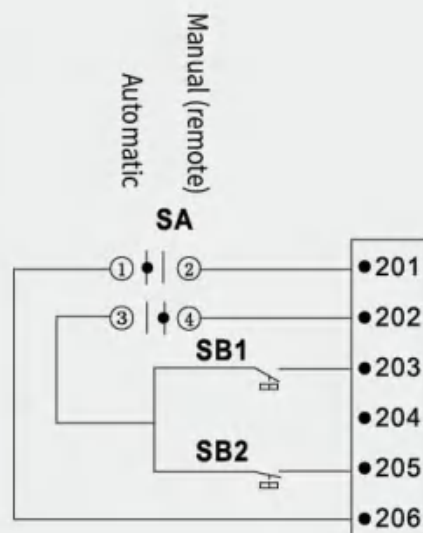
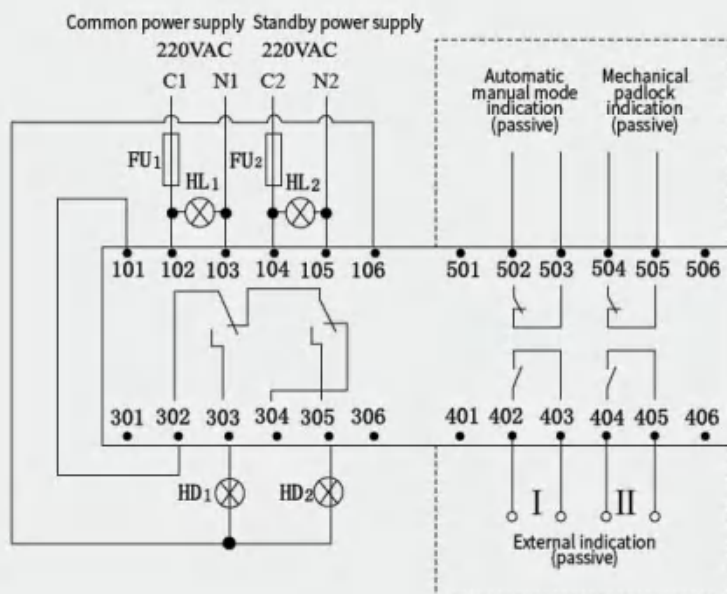


201, 206 short circuit



Reuse power generation signal output in case of power failure

◆ Full automatic+manual (remote control) wiring mode

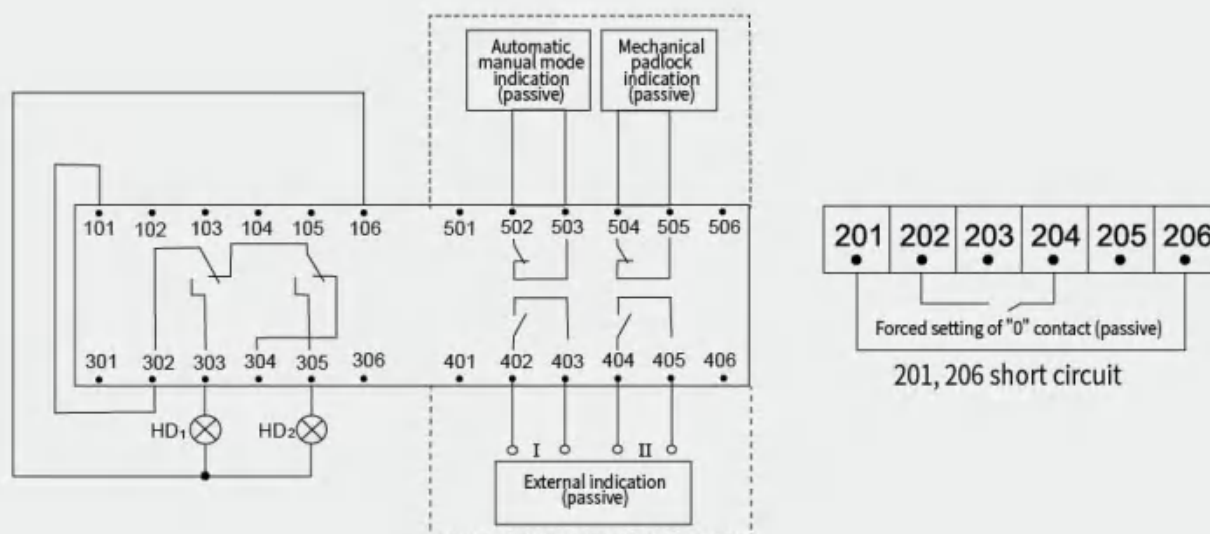




ZQ2G Dual power automatic switch

Connection mode

◆ 100~3200A wiring mode with controller



Reuse power generation signal output in case of power failure

Note: ① The products with controller 102, 103, 104 and 105 do not need external power supply;
② 401~406 and 501~506 switch terminals above 1000A can be selected.

◆ Description of letters and symbols

- ◇ C1 and N1 are the live line and zero line access at the common power input end, and C2 and N2 are the live line and zero line access at the standby power input end.
- HI1 and HI2 are power indication of common power supply and standby power supply respectively. HD1 and HD2 are the input indicators of common power supply and standby power supply respectively.
- FU1 and FU2 are 2A fuses;
- ◇ 101-106 and 201-206 are secondary wiring terminals of automatic transfer switch;
- ◇ 301~306 are external indicator terminals of automatic transfer switch;
- ◇ 401-406 and 501-506 automatic transfer switch terminals are optional;
- ◇ Fully automatic wiring methods 201 and 206 must be short-circuited;
- ◇ Forced setting of "0" contact (passive) can also input DC24V power supply;
- ◇ K1 is the power generation signal output (when there is no power in common use);
- ◇ SA is the automatic/manual function selection switch, SB1 and SB2 are the common power supply and the standby power supply manual input button (passive contact).

Striving for perfection is the driving force that we have been insisting on. Grasp every detail to make the product more perfect.



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Intelligent universal circuit breaker

Molded case circuit breaker

Intelligent molded case circuit breaker

Leakage molded case circuit breaker

Miniature circuit breaker

Self-resetting overvoltage and undervoltage

Dual power switch

Load disconnecter

Contactor thermal relay

Branch/busbar

ZQ2G-125E

Dual power automatic switch





ZQ2G-125E Dual power automatic switch

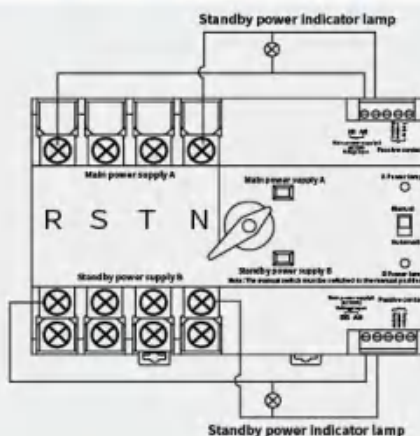


Product characteristics

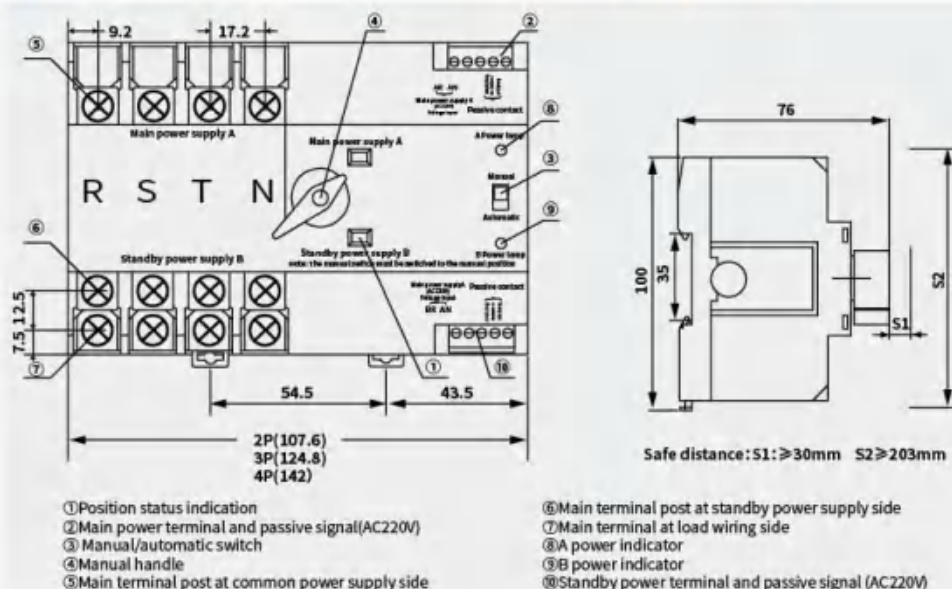
- ◇ Control device: built-in controller
- ◇ Product structure: no power off, guide rail type, large current, small volume, two-stage type, simple structure and ATS integration.
- ◇ Features: fast switching speed, low failure rate, convenient maintenance and reliable performance.
- ◇ Wiring mode: front-plate wiring
- ◇ Conversion mode: power grid to power grid, power grid to generator, automatic switching and self-recovery.
- ◇ Product shell frame: 100, 125
- ◇ Product current: 10, 16, 20, 25, 32, 40, 50, 63, 80, 100 and 125A.
- ◇ Product classification: direct load type
- ◇ Number of poles: 2, 3, 4
- ◇ Product standards: IEC60947-6-1, GB/T14048.11
- ◇ ATS E: PC level
- ◇ Switching time: 0.008s/8ms



ZQ2G-125E power supply and indicator light circuit diagram



Outline and installation dimension drawing of ZQ2G-125E



Striving for perfection is the driving force that we have been insisting on. Grasp every detail to make the product more perfect.



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Intelligent universal circuit breaker

Molded case circuit breaker

Intelligent molded case circuit breaker

Leakage molded case circuit breaker

Miniature circuit breaker

Self-resetting overvoltage and undervoltage

Dual power switch

Load disconnect

Contact thermal relay

Branch/busbar

ZQGL

Load disconnect



ZQGL Load disconnecter



Product overview

- ◇ Wiring mode: front-plate wiring, back-plate wiring;
- ◇ Operation mode: direct operation, operation outside of the cabinet;
- ◇ Product structure: small size, large current and compact structure;
- ◇ Other functions: negative lock function, visual contact window;
- ◇ Number of poles: 3, 4;
- ◇ Product current: 125, 160, 200, 250, 315, 400, 500, 630, 1000, 1250, 1600A; ;
- ◇ Compliance standards: IEC60947-3, IEC60947-6-1, GB/T 14048.3, GB/T 14048.11; ;
- ◇ ZQGL series load-disconnector is one of the products successfully developed by our company using the latest international technology in the 21st century. It is applicable to AC 50Hz, rated voltage below 660V and rated DC voltage below 440V, and rated working current between 125A and 1600A. It is used to make and break circuits infrequently.

Model and meaning

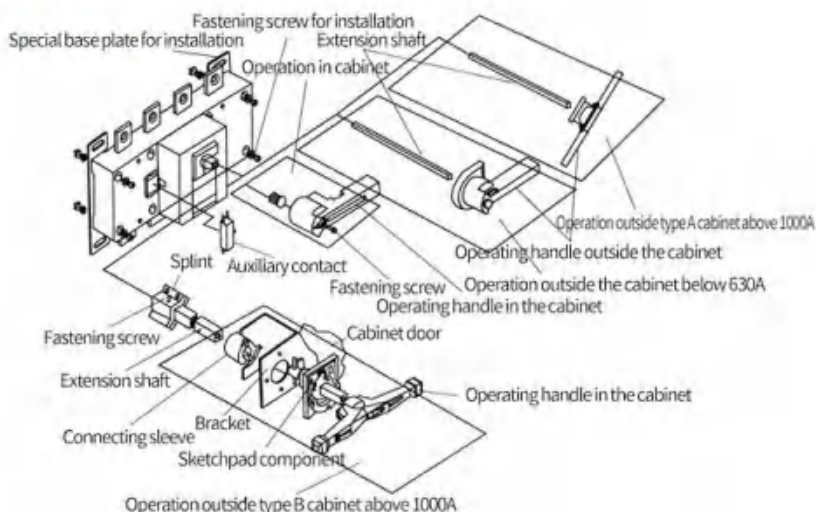
ZQ GL - 250 / 3 J K 11 B H

- Optional code for special operation
- Optional code of wiring mode
- Optional code of auxiliary contact function
- Window style optional code
- Optional code of operation mode
- Pole number optional code
- Rated current optional
- Shell frame grade current
- Product model
- Name of the company

Note

- ◇ Shell frame grade current: C represents side operation, Z1 represent up down arrangement, and Z2 represents left right arrangement;
- ◇ Optional rated current: 125/160/200/250/315/400/500/630/1000/1250/1600A;
- ◇ Optional code for the number of poles: 3 represents three poles, 4 represents four poles (3 poles+ neutral pole can be switched on or off);
- ◇ Optional code of operation mode: J represents operation outside the cabinet and operation inside the cabinet (note: not marked);
- ◇ Optional code of window style: K indicates direct observation of contact window (note: no need to mark);
- ◇ Optional code of auxiliary contact function: 11 represents one normally open and one normally closed, 12 represents two normally open and two normally closed;
- ◇ Optional codes for wiring mode: front-plate wiring (note: not marked), B refers to back-plate wiring;
- ◇ Optional code for special operation: H refers to operation behind the cabinet (note: it is not necessary to mark).

安装示意图



ZQGL Load disconnecter

Working conditions

- ◇ The altitude does not exceed 2000 meters;
- ◇ The ambient temperature is not higher than 40°C and not lower than -5°C ;
- ◇ The relative humidity is not more than 95%;
- ◇ Environment without explosive dangerous medium;
- ◇ No rain and snow attack the environment.

Operation mode

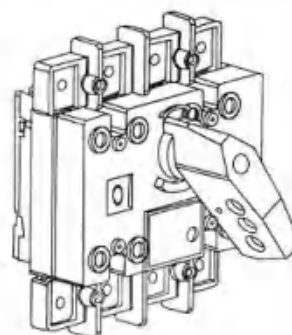
- ◇ Direct operation: the handle is directly installed in the middle of the switch;
- ◇ Operation outside the cabinet: the handle is installed outside the distribution cabinet;
- ◇ Two sets of auxiliary points can be equipped.

Main technical parameters

Agreed heating current Ith(A)			125A	160A	200A	250A	315A	400A	500A	630A	1000A	1250A	1600A
Rated insulation voltage Ui(V)			750	750	750	750	1000	1000	1000	1000	1000	1000	1000
Dielectric strength (v)			5000	5000	5000	5000	8000	8000	8000	8000	10000	10000	10000
Rated impulse withstand voltage Uimp kV (installation category IV)			4	4	4	4	4	4	4	4	8	8	8
Rated working current Ia(A)	380V	AC21	125	160	200	250	315	400	500	630	1000	1250	1600
		AC22	125	160	200	250	315	400	500	630	1000	1250	1600
		AC23	125	160	200	250	315	340	425	536	800	1000	1280
	660V	AC21	125	125	160	200	315	400	400	500	1000	1000	1600
		AC22	125	125	125	160	200	200	200	315	630	630	800
		AC23	50	60	70	80	125	125	125	125	400	400	500
	220V	DC21	125	160	200	250	315	400	500	630	1000	1250	1600
		DC22	125	125	200	250	315	400	400	500	1000	1250	1250
		DC23	125	125	160	200	315	400	400	500	1000	1250	1250
	440V	DC21	125	125	160	200	315	400	400	500	1000	1250	1250
		DC22	125	125	160	200	315	400	400	500	1000	1250	1250
		DC23	125	125	160	200	315	400	400	500	1000	1000	1000
	Motor power P(W)	220V	45	55	55	75	110	110	110	110	365	365	500
		380V	55	70	75	110	160	220	220	220	560	560	560
The rated short-time withstand current ICW (Ka) is 1.0s/0.1s			10/20	10/20	12/20	12/20	12/20	12/20	12/20	12/20	50/90	50/90	50/90
Rated breaking capacity Ic (A)AC230 380V			1000	1000	1600	1600	2500	3200	3200	3200	8000	8000	8000
Rated making capacity I(A)AC230 380V			1250	1250	2000	2000	3150	4000	4000	4000	10000	10000	10000
Rated short-time making capacity Icm (kA peak)			12	12	17	17	30	30	40	40	70	70	70
Mechanical life (number of cycles)	No load	7000	7000	7000	7000	7000	4000	4000	4000	2500	2500	2500	
	Loaded	1000	1000	1000	1000	1000	1000	1000	1000	500	500	500	
Operating torque (N.m)			6	6	10	10	14	14	14	14	25	25	25
Weight	3- pole	1	1	2	2	3.5	3.5	4	4	10.5	10.5	16	
	4- pole	1.5	1.5	2.5	2.5	4	4	4.5	4.5	13	13	20	

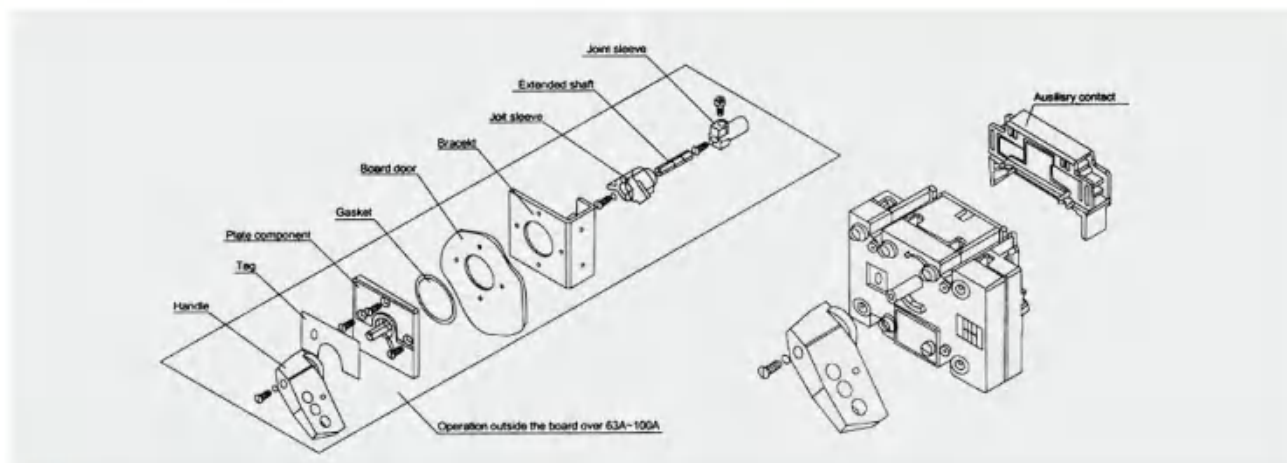
Product characteristics

- ◇ 63A-125A is applicable to the connection and disconnection of circuits or electrical isolation;
- ◇ 63A-125A has three poles and four poles (three poles+neutral pole can be switched on and off);
- ◇ Two groups of auxiliary points can be assembled as required;
- ◇ Operation inside and outside the side cabinet can be provided as required.

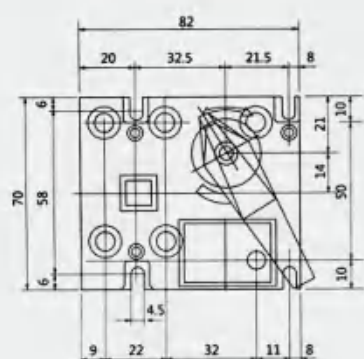




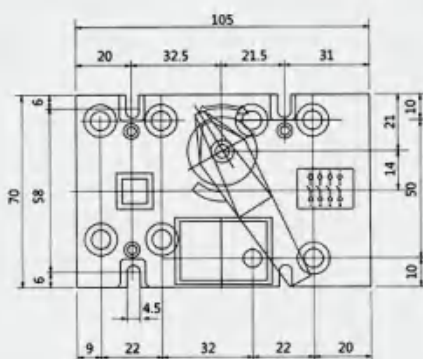
ZQGL
Load disconnecter



Shape and installation dimensions

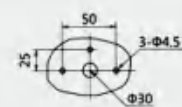
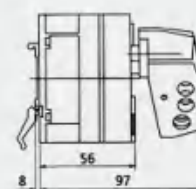


3P

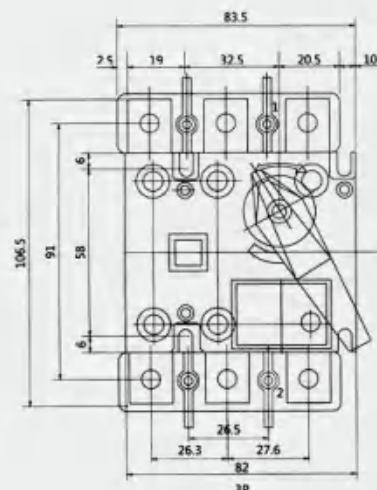


4P

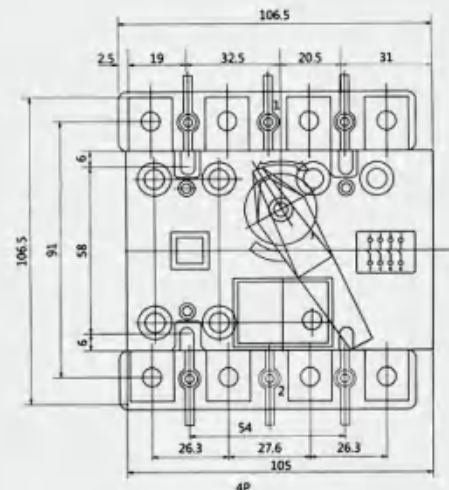
ZQGL-63A direct operation



Installation Size of handle
seat outside board.

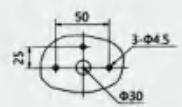
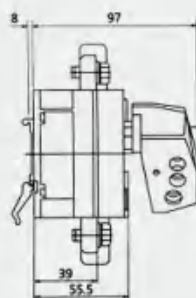


3P



4P

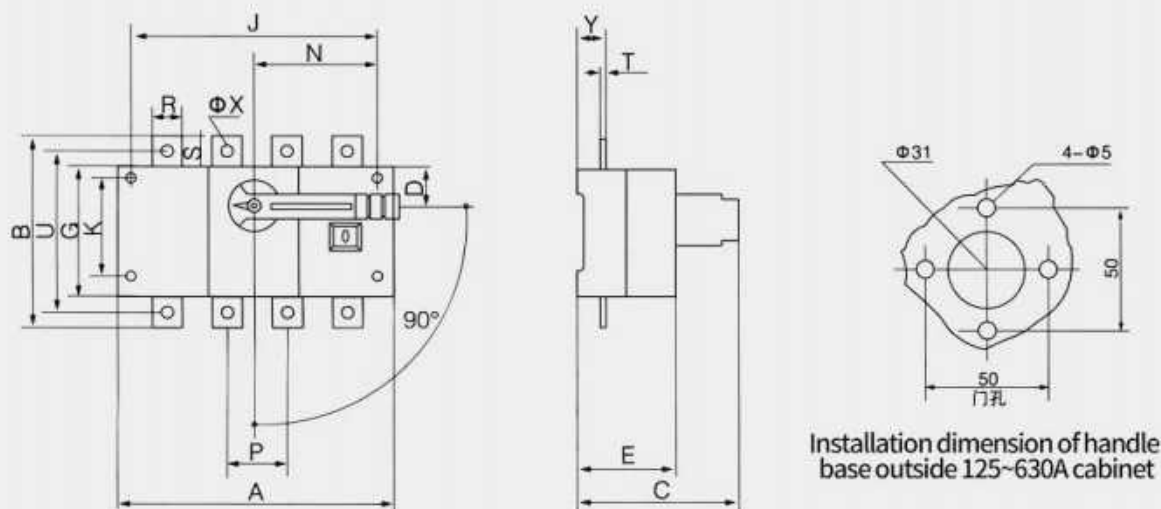
ZQGL-100A direct operation



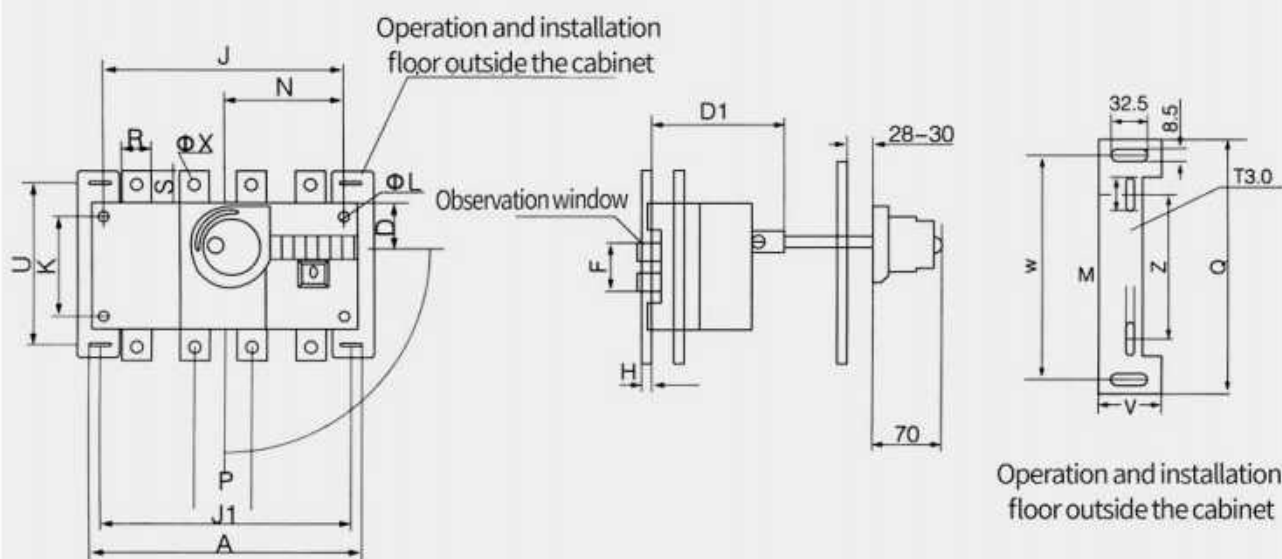
Installation Size of handle
seat outside board.

ZQGL
Load disconnecter

ZQGL-125A~630A Load-Disconnecter Outline Drawing



ZQGL-125~630 direct operation



ZQGL-125~630JK Operation outside the cabinet



ZQGL Load disconnecter

ZQGL-125A~630A Load-disconnector base plate size

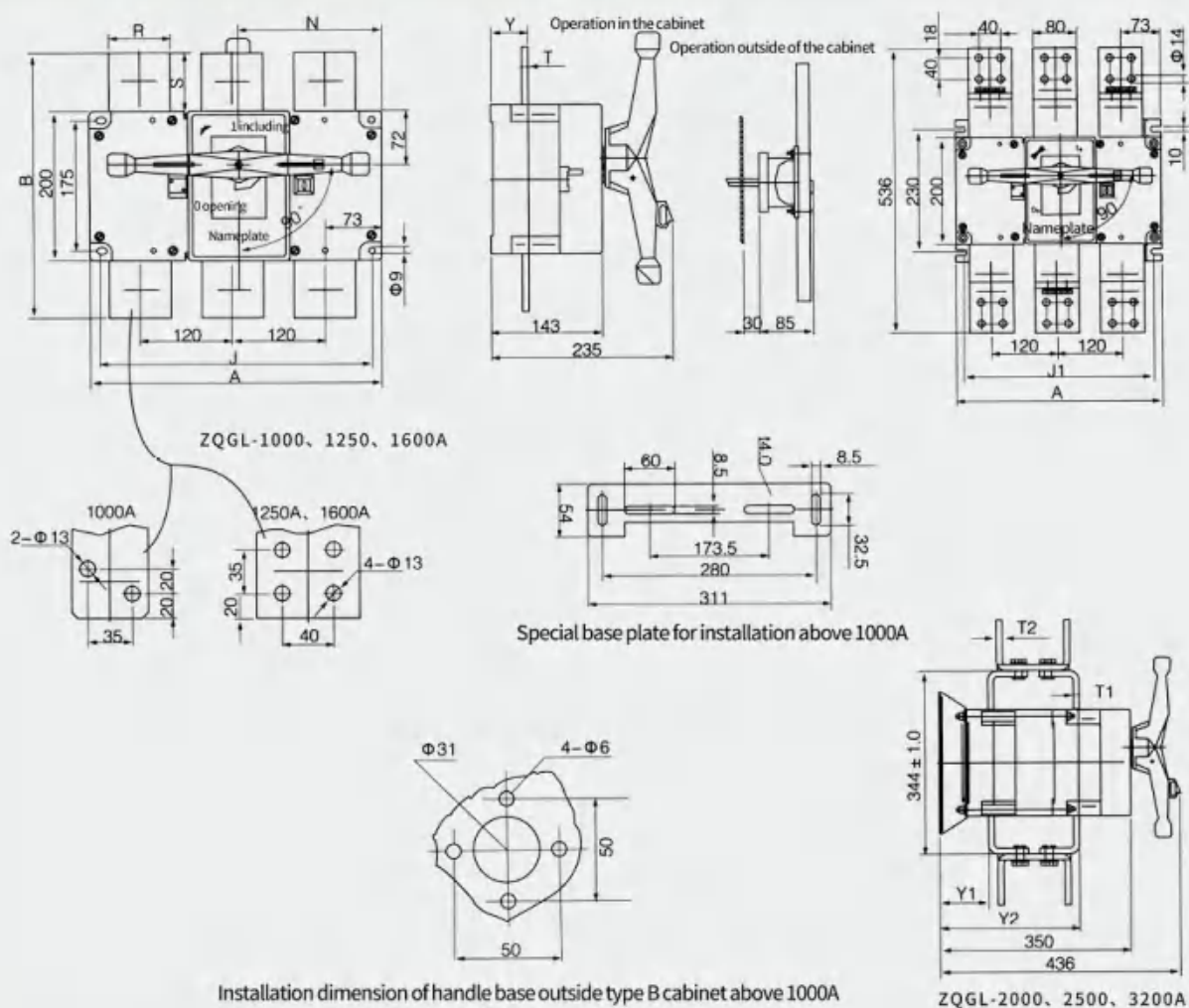
Specifications	Base plate size					
ZQGL-125~630A	I	M	Z	W	Q	V
125	55	5.5	85	190	218	54
160	55	5.5	85	190	218	54
200	55	5.5	85	190	218	54
250	55	5.5	85	190	218	54
315	60	6.5	130	240	270	55
400	60	6.5	130	240	270	55
500	60	6.5	130	240	270	55
630	60	6.5	130	240	270	55

Overall dimensions of ZQGL-125A~630A load-disconnector

Specifications	Overall dimensions and installation dimensions																				
ZQGL-125~630A	A	B	C	D	D1	E	G	ΦL	J	J1	K	N	P	R	S	T	U	ΦX	Y	F	H
125/3	140	135	116	27	92	73	85	5.5	120	120	65	75	35	20	25	3	115	9	20	52	10
125/4	170	135	116	27	92	73	85	5.5	150	150	65	75	35	20	25	3	115	9	20	52	10
160/3	140	135	116	27	92	73	85	5.5	120	120	65	75	35	20	25	3	115	9	20	52	10
160/4	170	135	116	27	92	73	85	5.5	150	150	65	75	35	20	25	3	115	9	20	52	10
200/3	180	170	130	35	98	84	110	5.5	160	160	90	126	50	25	30	3	140	11	25	79	13
200/4	230	170	130	35	98	84	110	5.5	210	210	90	126	50	25	30	3	140	11	25	79	13
250/3	180	170	130	35	98	84	110	5.5	160	160	90	126	50	25	30	3	140	11	25	79	13
250/4	230	170	130	35	98	84	110	5.5	210	210	90	126	50	25	30	3	140	11	25	79	13
315/3	230	240	172	50	135	117	160	7	210	210	140	135	65	30	40	5	205	11	37	125	24
315/4	290	240	172	50	135	117	160	7	270	270	140	135	65	30	40	5	205	11	37	125	24
400/3	230	240	172	50	135	117	160	7	210	210	140	135	65	30	40	5	205	11	37	125	24
400/4	290	240	172	50	135	117	160	7	270	270	140	135	65	30	40	5	205	11	37	125	24
500/3	230	259	173	50	135	117	160	7	210	210	140	135	65	40	49	5	220	13	37	125	24
500/4	290	259	173	50	135	117	160	7	270	270	140	135	65	40	49	5	220	13	37	125	24
630/3	230	259	173	50	135	117	160	7	210	210	140	135	65	40	49	5	220	13	37	125	24
630/4	290	259	173	50	135	117	160	7	270	270	140	135	65	40	49	5	220	13	37	125	24

ZQGL
Load disconnecter

ZQGL-1250A~1600A Load-Disconnecter Outline Drawing



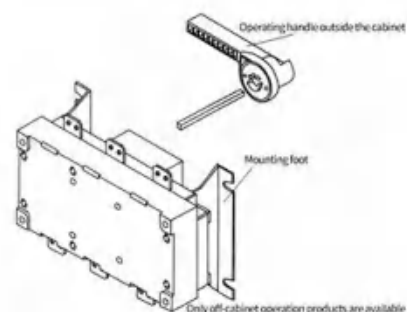
Overall dimensions and installation dimensions of ZQGL-1250A~1600A

Specifications	Overall dimensions and installation dimensions								
ZQGL-1250~1600A	A	B	J	J1	N	R	S	T	Y
1250/3	378	315	353	353	186	60	56	8	48
1250/4	498	315	473	473	246	60	56	8	48
1250/3	378	357	353	353	186	80	78.5	8	48
1250/4	498	357	473	473	246	80	78.5	8	48
1600/3	378	357	353	353	186	80	78.5	10	49
1600/4	498	357	473	473	246	80	78.5	10	49

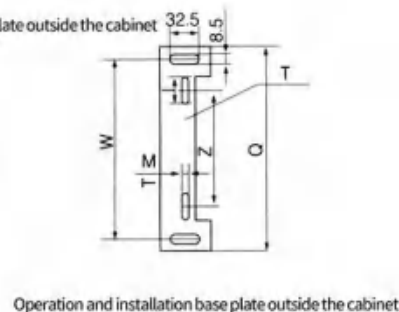
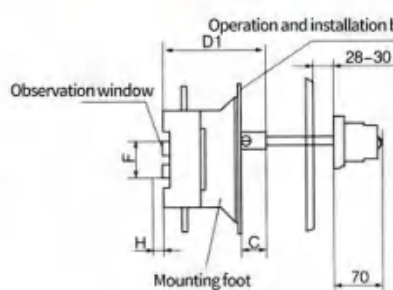
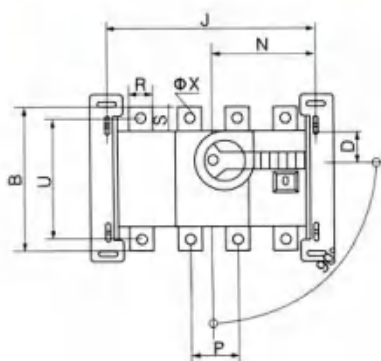
ZQGL Load disconnecter

ZQGL-125A~630A/H rear operating load - disconnecter

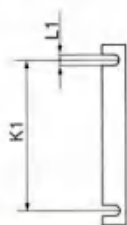
- ◇ 125A~630A is applicable to the connection and disconnection of circuits or electrical isolation, and above 1250A is only applicable to electrical isolation.
- ◇ 125A-630A has three poles and four poles (three poles+neutral pole can be switched on and off).
- ◇ Under 630A, products with observation windows can be provided as required to directly observe the on-off state of the contacts.
- ◇ Two sets of auxiliary points can be equipped as required.
- ◇ The electrical and mechanical properties are the same as those of ZQGL-125~1600.



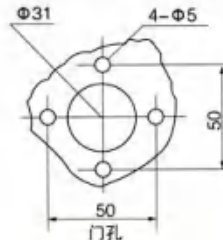
ZQGL-125A~630A/H rear operating load - disconnecter



ZQGL-125-630JKH Operation outside the cabinet



Mounting foot



Installation dimension of handle base outside 125-630A cabinet

Specifications	Footing size	
	K1	L1
ZQGL-1250	238	10
ZQGL-1600	238	15

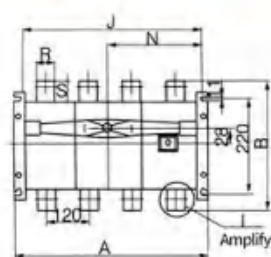
Specifications	Base plate size					
	I	M	Z	W	Q	T
ZQGL-125~630A						
125	60	6.5	115	240	270	3
160	60	6.5	115	240	270	3
200	62	8.5	115	240	270	3
250	62	8.5	115	240	270	3
315	65	11	170	280	311	4
400	65	11	170	280	311	4
500	65	11	170	280	311	4
630	65	11	170	280	311	4

ZQGL Load disconnecter

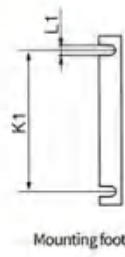
ZQGL-125A~630A/H rear operating load - external dimension of disconnecter

Specifications	Base plate size												
ZQGL-125~630A/H	B	C	D	D1	J	N	P	R	S	U	ΦX	F	H
125/3	135	14	27	92	120	75	35	20	25	115	9	52	10
125/4	135	14	27	92	150	75	35	20	25	115	9	52	10
160/3	135	14	27	92	120	75	35	20	25	115	9	52	10
160/4	135	14	27	92	150	75	35	20	25	115	9	52	10
200/3	170	16	35	98	160	126	50	25	30	140	11	79	13
200/4	170	16	35	98	210	126	50	25	30	140	11	79	13
250/3	170	16	35	98	160	126	50	25	30	140	11	79	13
250/4	170	16	35	98	210	126	50	25	30	140	11	79	13
315/3	240	15	50	135	210	135	65	30	40	205	11	125	24
315/4	240	15	50	135	270	135	65	30	40	205	11	125	24
400/3	240	15	50	135	210	135	65	30	40	205	11	125	24
400/4	240	15	50	135	270	135	65	30	40	205	11	125	24
500/3	259	15	50	135	210	135	65	40	49	220	13	125	24
500/4	259	15	50	135	270	135	65	40	49	220	13	125	24
630/3	259	15	50	135	210	135	65	40	49	220	13	125	24
630/4	259	15	50	135	270	135	65	40	49	220	13	125	24

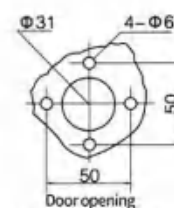
ZQGL-125A~630A Load-disconnector overall dimension



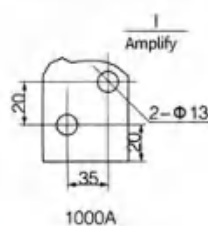
ZQGL-1000~1600JH Operation outside of the cabinet



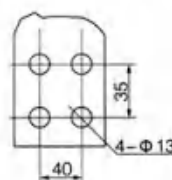
Mounting foot



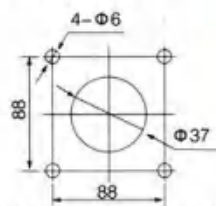
Installation dimension of handle base outside type B cabinet above 1000A



1000A



1250A~1600A



Installation dimension of handle base outside type A cabinet above 1000A

Specifications	Footing size	
	K1	L1
ZQGL-1250	238	10
ZQGL-1600	238	15

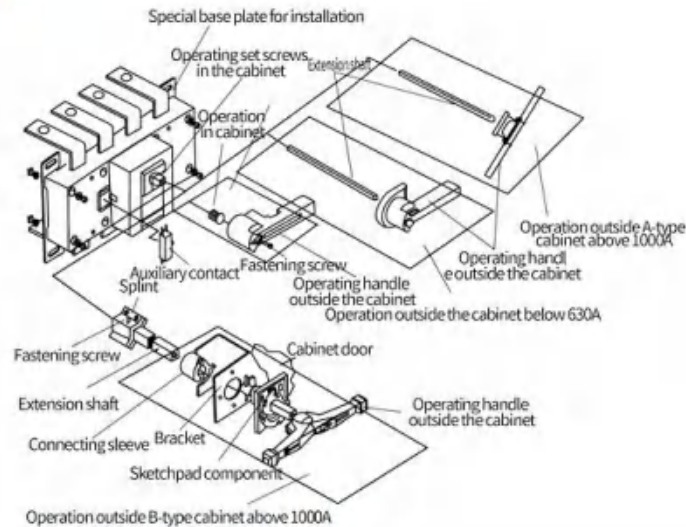
Specifications	Base plate size								
ZQGL-1250~1600A/H	A	B	J	J1	N	R	S	T	Y
1250/3	378	315	353	353	174	60	56	8	48
1250/4	498	315	473	473	234	60	56	8	48
1250/3	378	357	353	353	174	80	78.5	8	48
1250/4	498	357	473	473	234	80	78.5	8	48
1600/3	378	357	353	353	174	80	78.5	10	49
1600/4	498	357	473	473	234	80	78.5	10	49

ZQGL Load disconnecter

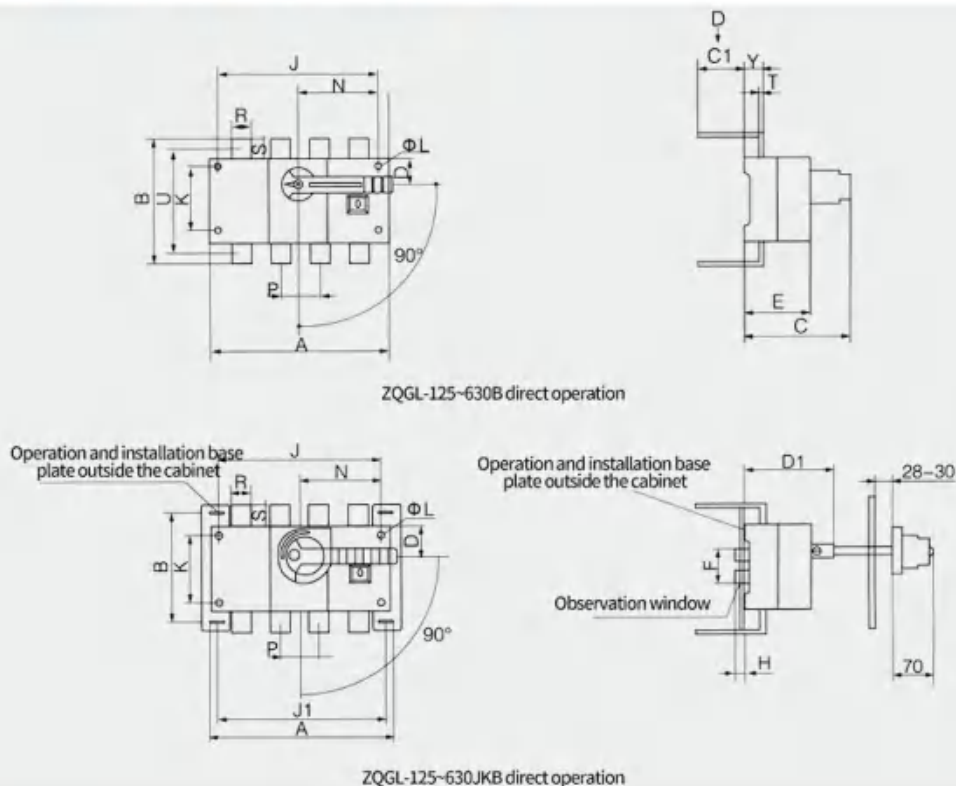
ZQGL-125A~1600A/B rear wiring

- ◇ 125A-630A is applicable to the connection and disconnection of circuits or electrical isolation;
- ◇ Above 1250A is only applicable to electrical isolation;
- ◇ 125A-630A has three poles and four poles (three poles+neutral pole can be switched on and off);
- ◇ Under 630A, products with observation windows can be provided as required to directly observe the on-off status of contacts;
- ◇ Two sets of auxiliary contacts can be equipped as required;
- ◇ Electrical and mechanical properties correspond to those of ZQGL-125~1600.

Installation diagram

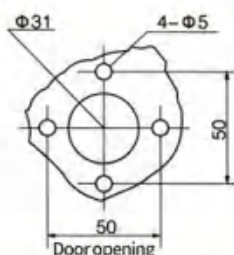


ZQGL-125A~630A/B rear wiring outline drawing

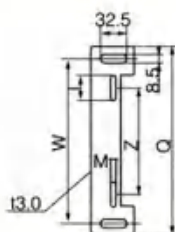


ZQGL Load disconnecter

ZQGL-125A~630A/B rear wiring load-disconnector outline drawing



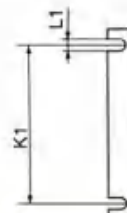
Installation dimension of handle
base outside 125-630A cabinet



Installation dimension of handle
base outside 125-630A cabinet



Rear wiring terminal



Mounting foot

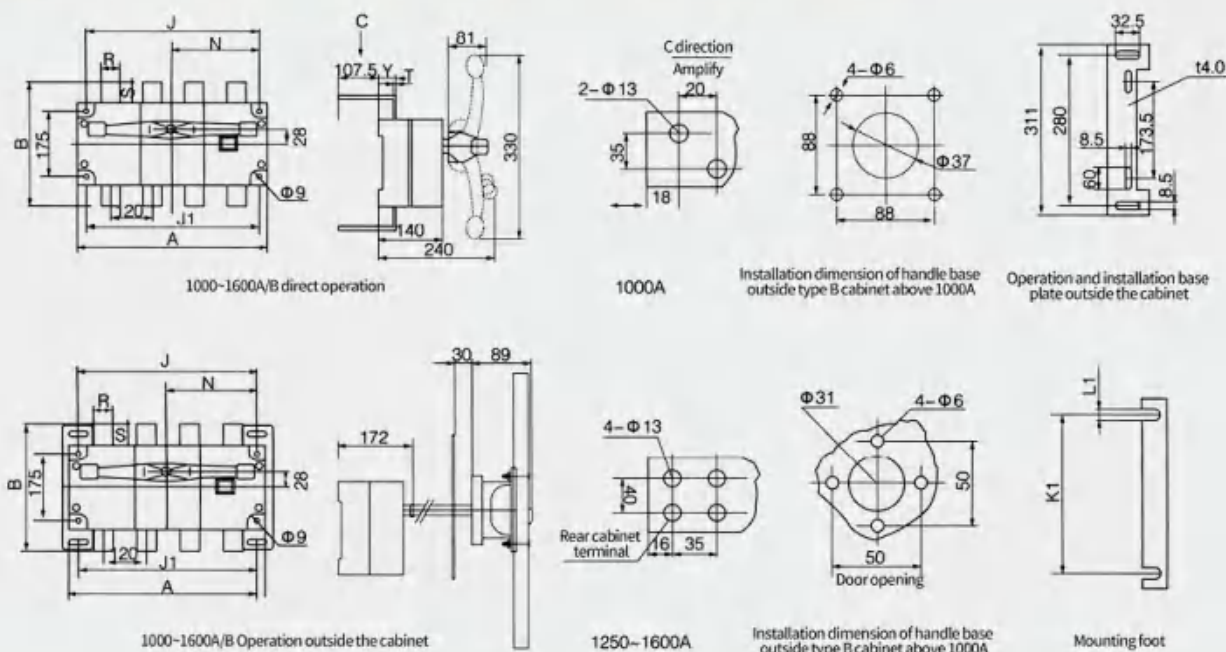
Specifications	Footing size	
	K1	L1
ZQGL-125~160	95	7
ZQGL-200~250	113	9
ZQGL-315~630	180	9.5

Specifications	Footing size				
	I	M	Z	W	Q
ZQGL-125~630A/B					
125	55	5.5	85	190	218
160	55	5.5	85	190	218
200	55	5.5	85	190	218
250	55	5.5	85	190	218
315	60	6.5	130	240	270
400	60	6.5	130	240	270
500	60	6.5	130	240	270
630	60	6.5	130	240	270

Specifications	Base plate size																			
	A	B	C	C1	D	D1	E	E1	OL	J	J1	K	N	P	R	S	T	U	ΦX	Y
ZQGL-125~630A/B																				
125/3	140	135	116	70	27	92	73	10	5.5	120	120	65	75	35	20	25	3	115	9	20
125/4	170	135	116	70	27	92	73	10	5.5	150	150	65	75	35	20	25	3	115	9	20
160/3	140	135	116	70	27	92	73	10	5.5	120	120	65	75	35	20	25	3	115	9	20
160/4	170	135	116	70	27	92	73	10	5.5	150	150	65	75	35	20	25	3	115	9	20
200/3	180	170	130	75	35	98	84	15	5.5	160	160	90	126	50	25	30	3	140	11	25
200/4	230	170	130	75	35	98	84	15	5.5	210	210	90	126	50	25	30	3	140	11	25
250/3	180	170	130	75	35	98	84	15	5.5	160	160	90	126	50	25	30	3	140	11	25
250/4	230	170	130	75	35	98	84	15	5.5	210	210	90	126	50	25	30	3	140	11	25
315/3	230	240	172	83	50	135	117	17	7	210	210	140	135	65	30	40	5	205	11	37
315/4	290	240	172	83	50	135	117	17	7	270	270	140	135	65	30	40	5	205	11	37
400/3	230	240	172	83	50	135	117	17	7	210	210	140	135	65	30	40	5	205	11	37
400/4	290	240	172	83	50	135	117	17	7	270	270	140	135	65	30	40	5	205	11	37
500/3	230	259	173	83	50	135	117	20	7	210	210	140	135	65	40	49	5	220	13	37
500/4	290	259	173	83	50	135	117	20	7	270	270	140	135	65	40	49	5	220	13	37
630/3	230	259	173	83	50	135	117	20	7	210	210	140	135	65	40	49	5	220	13	37
630/4	290	259	173	83	50	135	117	20	7	270	270	140	135	65	40	49	5	220	13	37

ZQGL Load disconnecter

ZQGL-1250A~1600A/B rear wiring load disconnecter outline drawing



Specifications	Footing size	
	K1	L1
ZQGL-1250	238	10
ZQGL-1600	238	10

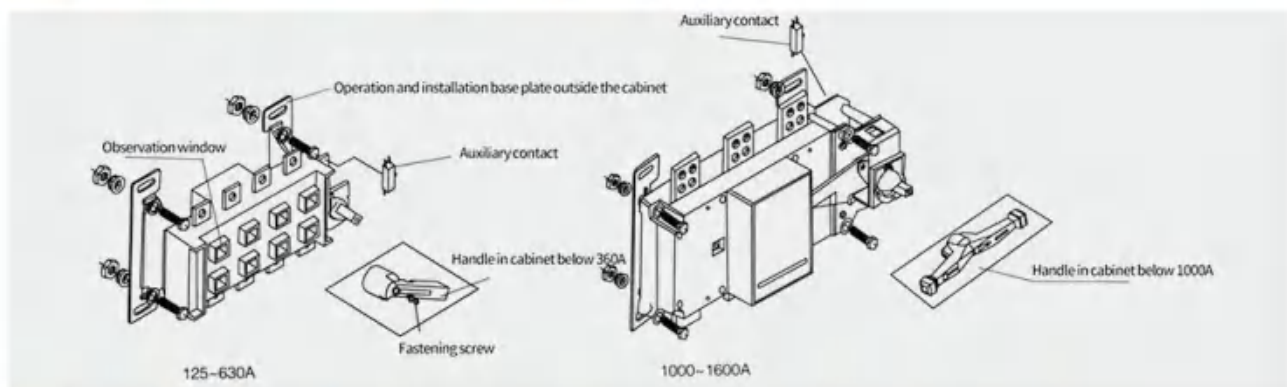
Specifications	Overall dimensions and installation dimensions								
	A	B	J	J1	N	R	S	T	Y
ZQGL-1250~1600A/B									
1250/3	378	315	353	353	174	60	56	8	48
1250/4	498	315	473	473	234	60	56	8	48
1250/3	378	357	353	353	174	80	78.5	8	48
1250/4	498	357	473	473	234	80	78.5	8	48
1600/3	378	357	353	353	174	80	78.5	10	49
1600/4	498	357	473	473	234	80	78.5	10	49

ZQGL-125A~1600A side door operating load - disconnecter

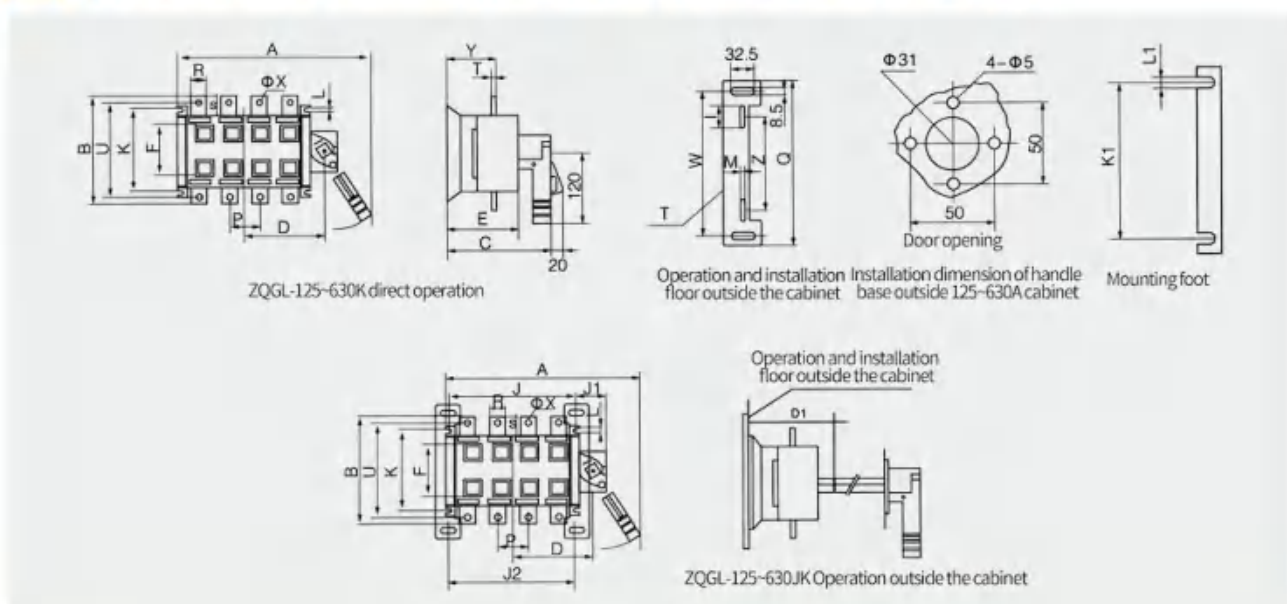
- ◇ 125A~1600A is applicable to the connection and disconnection of circuits or electrical isolation;
- ◇ Above 1250A is only applicable to electrical isolation;
- ◇ 125A~630A has three poles and four poles (three poles+neutral pole can be switched on and off);
- ◇ Under 630A, products with observation windows can be provided as required to directly observe the on-off status of contacts;
- ◇ Two sets of auxiliary contacts can be equipped as required;
- ◇ Electrical and mechanical properties are the same as those of ZQGL-125~1600A.

ZQGL
Load disconnecter

ZQGL-125A~1600A side door operating load - disconnecter



ZQGLC-125A~630A/B side door operating load-disconnector outline drawing



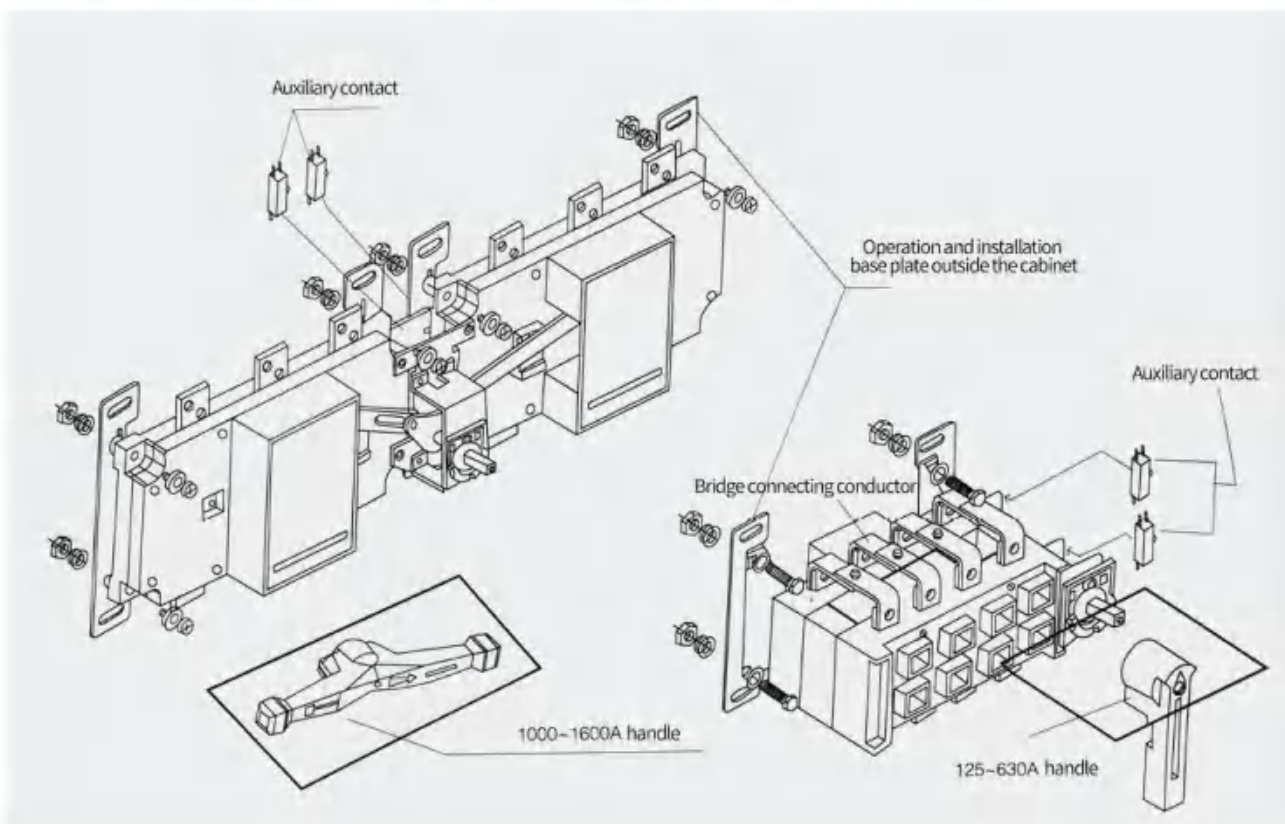
ZQGL Load disconnecter

ZQGLC-1250~1600A side operating load - installation dimension of disconnecter

Specifications	Base plate size																
ZQGLC-1250~1600A/B	A	B	C	D	E	F	J	K	Ψ B	N	P	Q	R	S	T	W	Z
1250/3	378	200	242	140.5	163	47.5	353	175	8.5	229	120	311	60	56	8	280	224
1250/4	498	200	242	140.5	163	47.5	473	175	8.5	298	120	311	60	56	8	280	224
1250/3	378	200	242	140.5	163	47.5	353	175	8.5	229	120	311	80	69	8	280	224
1250/4	498	200	242	140.5	163	47.5	473	175	8.5	298	120	311	80	69	8	280	224
1600/3	378	200	242	140.5	163	47.5	353	175	8.5	229	120	311	80	69	10	280	224
1600/4	498	200	242	140.5	163	47.5	473	175	8.5	298	120	311	80	69	10	280	224

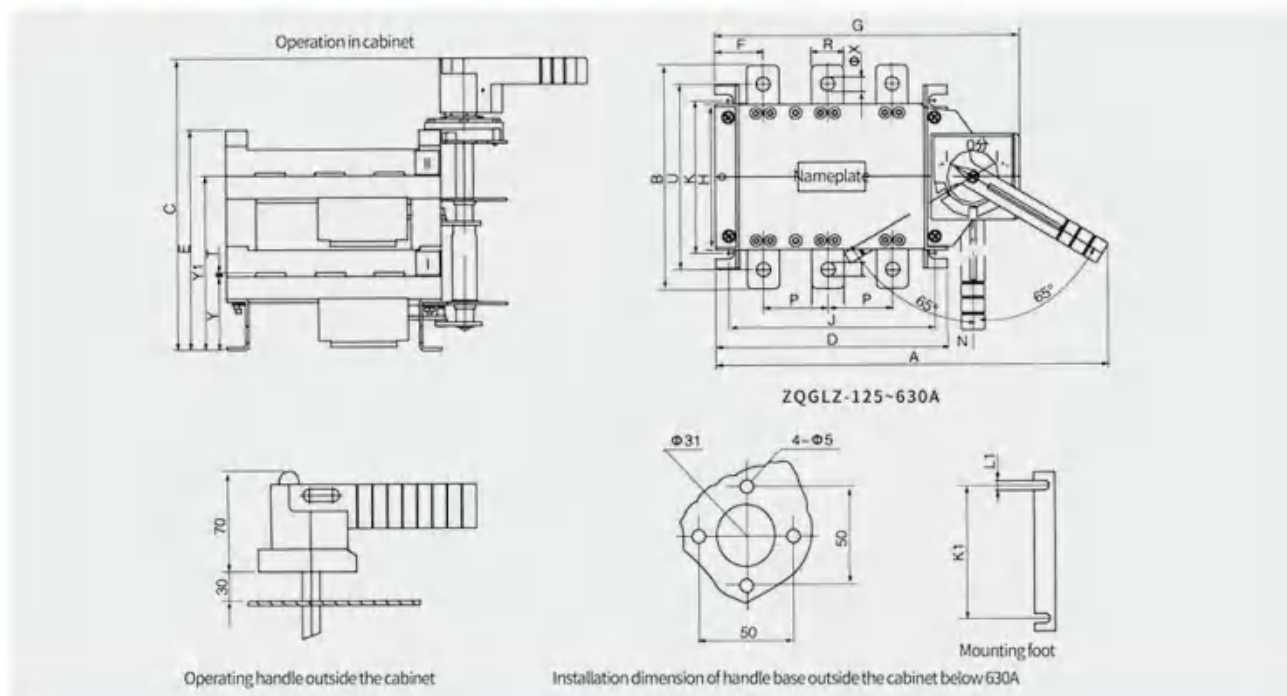
ZQGLC-125A~1600A side operating load - disconnecter

- ◇ ZQGLZ-125 ~ 1600A is applicable for the switching of two low-voltage circuits or the switching or safety isolation of two load devices;
- ◇ Operation mode: the handle is installed on the switch;
- ◇ Operation outside the cabinet: the handle is installed outside the distribution cabinet;
- ◇ Products with observation windows can be provided as required to directly observe the on-off state of contacts;
- ◇ There are three poles and four poles (three poles+neutral pole can be switched on and off);
- ◇ Extended shaft is used for operation outside the cabinet;
- ◇ Two sets of auxiliary contacts can be equipped as required;
- ◇ Electrical and mechanical properties are the same as those of ZQGL-125~1600;
- ◇ It can provide the incoming terminal or outgoing terminal of the bridge-type connecting conductor switch.



ZQGL
Load disconnecter

ZQGLZ-125~630A/B Side Operating Load-Disconnecter Outline Drawing

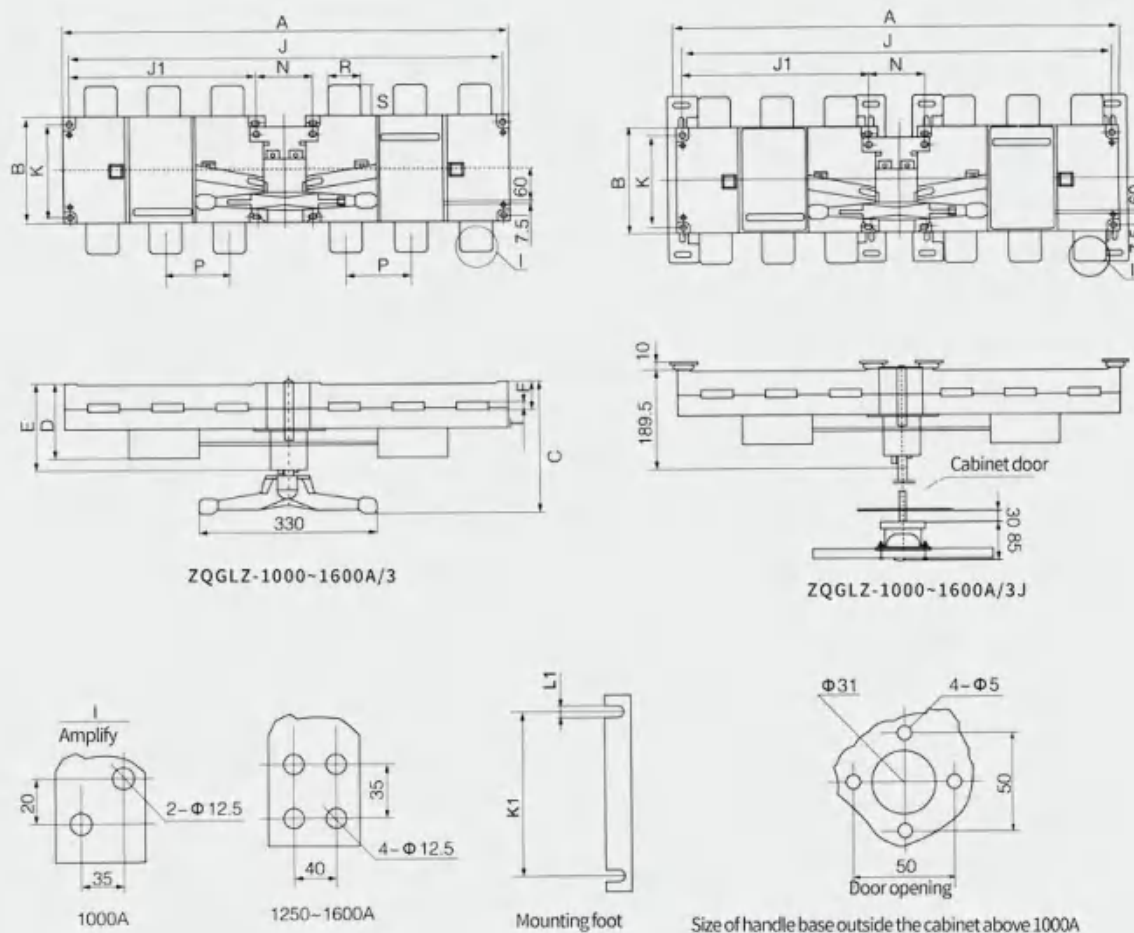


Specifications	Footing size	
	K1	L1
ZQGL-125~160	95	7
ZQGL-200~250	113	9
ZQGL-315~630	180	9.5

Specifications	Overall dimension and installation dimension																		
ZQGLZ-125-630A	A	B	C	D	E	F	G	H	J	K	L	N	P	R	T	U	ΦX	Y	Y1
125/3	267	135	220	140	152	30	195	85	120	95	7	20	35	20	3	115	9	52	124
125/4	297	135	220	170	152	30	225	85	120	95	7	20	35	20	3	115	9	52	124
160/3	267	135	220	140	152	30	195	85	120	95	7	20	35	20	3	115	9	52	124
160/4	297	135	220	170	152	30	225	85	120	95	7	20	35	20	3	115	9	52	124
200/3	420	170	240	180	180	37	235	110	160	115	9	20	50	25	3	140	11	60	142
200/4	480	170	240	230	180	37	285	110	160	115	9	20	50	25	3	140	11	60	142
250/3	420	170	240	180	180	37	235	110	160	115	9	20	50	25	3	140	11	60	142
250/4	480	170	240	230	180	37	285	110	160	115	9	20	50	25	3	140	11	60	142
315/3	420	240	330	230	244	48	300	160	210	180	10	35	65	30	5	205	11	80	194
315/4	480	240	330	290	244	48	360	160	270	180	10	35	65	30	5	205	11	80	194
400/3	420	240	330	230	244	48	300	160	210	180	10	35	65	30	5	205	11	80	194
400/4	480	240	330	290	244	48	360	160	270	180	10	35	65	30	5	205	11	80	194
500/3	420	259	330	230	244	48	300	160	210	180	10	35	65	40	5	220	13	80	194
500/4	480	259	330	290	244	48	360	160	270	180	10	35	65	40	5	220	13	80	194
630/3	420	259	330	230	244	48	300	160	210	180	10	35	65	40	5	220	13	80	194
630/4	480	259	330	290	244	48	360	160	270	180	10	35	65	40	5	220	13	80	194

ZQGL
Load disconnecter

ZQGLC-1250~1600A side operating load - installation dimension of disconnecter

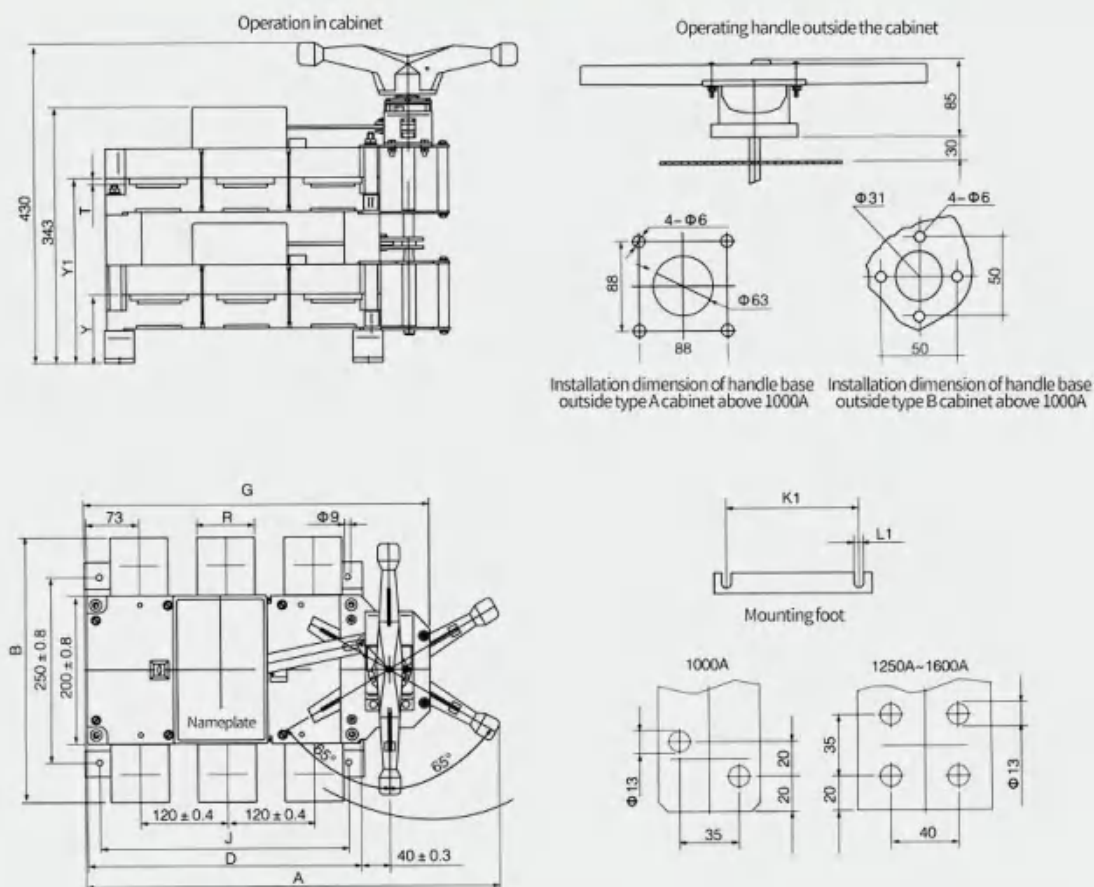


Specifications	Foot size	
	K1	L1
ZQGL-1250A	238	10
ZQGL-1600A	238	15
ZQGL-2000A	238	12

Specifications	Overall dimension and installation dimension													
ZQGLZ-1250~1600A	A	B	C	D	E	F	J	J1	K	N	P	R	S	T
1250/3	836	200	242	140	168	48	811	353	175	105	120	60	56	8
1250/4	1076	200	242	140	168	48	1051	467	175	105	120	60	56	8
1250/3	836	200	242	140	168	48	811	353	175	105	120	80	78	8
1250/4	1076	200	242	140	168	48	1051	467	175	105	120	80	78	8
1600/3	836	200	242	140	168	49	811	353	175	105	120	80	78	10
1600/4	1076	200	242	140	168	49	1051	467	175	105	120	80	78	10

ZQGL
Load disconnecter

ZQGLZ-1250~1600A upper and lower transfer load disconnecter overall dimensions



Specifications	Foot size	
	K1	L1
ZQGL-1250A	238	10
ZQGL-1600A	238	15
ZQGL-2000A	238	12

Specifications	Overall dimension and installation dimension								
ZQGLZ-1250~1600A	A	B	D	G	J	R	T	Y	Y1
1250/3	578	312	378	476	343	60	8	92	248
1250/4	698	312	498	596	463	60	8	92	248
1250/3	578	356	378	476	343	80	8	92	248
1250/4	698	356	498	596	463	80	8	92	248
1600/3	578	356	378	476	343	80	10	93	249
1600/4	698	356	498	596	463	80	10	93	249



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Intelligent universal circuit breaker

Molded case circuit breaker

Intelligent molded case circuit breaker

Leakage molded case circuit breaker

Miniature circuit breaker

Self-resetting overvoltage and undervoltage

Dual power switch

Load disconnecter

Contactor thermal relay

Branch/busbar

CJX2

AC Contactor & thermal relay



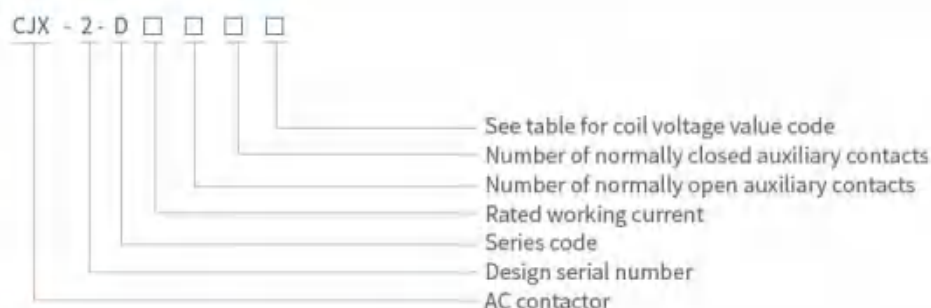
CJX2
Ac contactor



Product overview

- ◇ CJX2 series AC contactors (hereinafter referred to as contactors) are applicable to circuits with AC 50Hz or 60Hz, working voltage up to 660V, rated working voltage up to 380V and working current up to 95A under AC-3 use category, for remote connection and disconnection of circuits and frequent starting and control of AC motors. Contactors can also be assembled into building block auxiliary contact group, air delay head, mechanical interlocking mechanism and other components to form delay contactors Reversible contactor and star-delta starter can be directly inserted and installed with thermal relay to form electromagnetic starter.
- ◇ Compliance standards: IEC60947-4-1,GB/T 14048.4.

Model meaning



Main technical parameters

Model	CJX2-D09	CJX2-D12	CJX2-D18	CJX2-D25	CJX2-D32	CJX2-D40	CJX2-D50	CJX2-D63	CJX2-D80	CJX2-D95
Rated insulation voltage (V)	660	660	660	660	660	660	660	660	660	660
Agreed heating current I _t (V)	25	25	32	40	50	60	80	80	125	125
Rated working power 380VAC3	9	12	16	25	32	40	50	63	80	95
Control power (kW)	220V	2.2	3	4	5.5	7.5	11	15	18.5	22
	380V	4	5.5	7.5	11	15	18.5	22	30	37
	415V	4	5.5	9	11	15	22	25	37	45
	440V	4	5.5	9	11	15	22	30	37	45
	660V	5.5	7.5	10	15	18.5	30	33	37	45
Remarks	Installation method: 1. Install with two screws. 2. 35mm guide rail installation. 1. Install the three screws. 2. 75mm or 35mm									

Note:

- ◇ 3P: three pairs of normally open main contacts NO: one pair of normally open auxiliary contacts.
- NC: a pair of normally closed auxiliary contacts
- ◇ 0901-3201 1NC 40-95 1NO+1NC
- ◇ 0910-3210 1NC

Coil parameters

Model	CJX2-D09	CJX2-D12	CJX2-D18	CJX2-D25	CJX2-D32	CJX2-D40	CJX2-D50	CJX2-D63	CJX2-D80	CJX2-D95
Rated insulation	660	660	660	660	660	660	660	660	660	660
Agreed heating	25	25	32	40	50	60	80	80	125	125
Control power (kW)	220V	2.2	3	4	5.5	7.5	11	15	18.5	22
	380V	4	5.5	7.5	11	15	18.5	22	30	37
	415V	4	5.5	9	11	15	22	25	37	45
	440V	4	5.5	9	11	15	22	30	37	45
	660V	5.5	7.5	10	15	18.5	30	33	37	45

CJX2
Ac contactor

Parameter performance

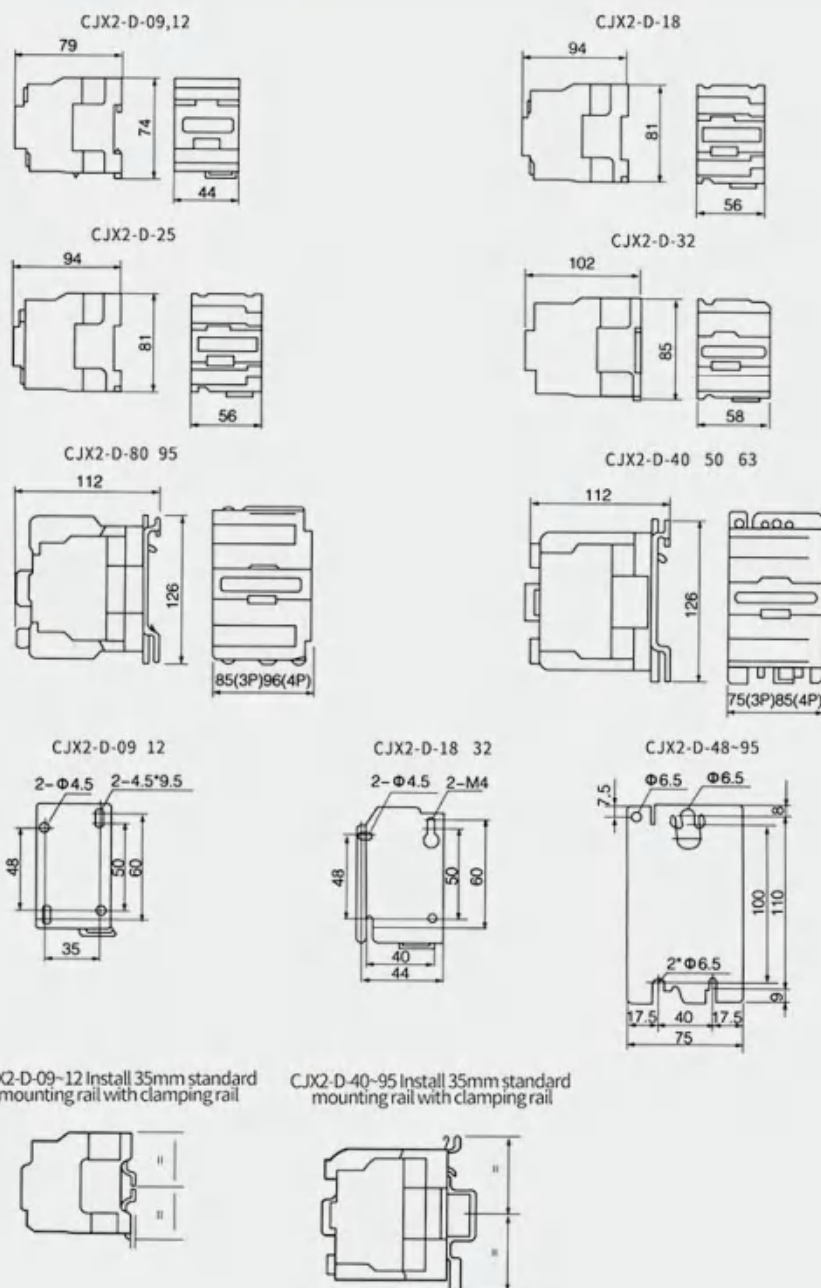
Model		Unit	CJX2-D115	CJX2-D150	CJX2-D170	CJX2-D205	CJX2-D245	CJX2-D300	CJX2-D410	CJX2-D475	CJX2-D620
Rated current AC3 $U_e \leq 440V$		A	115	150	170	205	245	300	410	475	620
Rated heating current AC3 $u_e \leq 40$		A	200	250	250	275	315	400	500	700	1250
Rated power AC3 3-phase motor 0 ≤ 40	220/240V	KW	30	40	55	63	75	125	110	147	200
	380/400V	KW	55	75	90	110	132	160	220	265	335
	400V	KW	59	80	125	110	132	200	250	280	400
	500V	KW	75	80	110	120	160	200	250	335	400
	600/690V	KW	80	125	110	129	160	220	280	355	450
	1250V	KW	75	80	125	125	147	160	185	335	450
Rated power AC4 3-phase motor 0 ≤ 40	200/230V	KW	9	11	22	25	30	37	40	45	55
	380/400V	KW	18.5	22	40	45	55	63	75	80	125
	440V	KW	18.5	22	45	51	63	75	80	125	110
	500V	KW	30	37	51	59	75	80	90	110	132
Total capacity		kg	2.25	2.25	2.25	4.6	4.7	8.2	8.5	10.8	17.4
Volume H×L×W		mm ²	158	158	158	174	197	206	206	238	304
			120	120	120	181	181	219	219	233	255
			132	130	130	168.5	168.5	213	213	232	309
Power supply connection wire section		mm ²	120	120	120	150 2 □ 25×4	185 2 □ 25×5	240 2 □ 25×5	2×150 2 □ 30×5	2×300 2 □ 40×5	2 □ 40×8 2 □ 60×5
Mountingscrew H × L-Φ Number of guide rails × guide width × rail center distance		mm	130×(95- 110)-6.5 2×35×125	130×(95- 110)-6.5 2×35×125	130×(95- 110)-6.5 2×35×125	(160-120) ×80-6.5	(160-120) ×80-6.5	(160-120) ×80-6.5	180×80(66 -102)-8.5	180×80(66 -102)-8.5	180×180 (125-195) -10.5
Auxiliary contact group (recommended)		V	24(B5) 42(D5) 48(E5) 110(F5) 220(M5) 240(U5) 380(Q5) 400(V5) 440(R5) 500(S5) 600(Y5)								
		V	24(B6) 42(D6) 48(E6) 110(F6) 220(M6) 240(U6) 380(Q6) 440(R6)								
		V	24(B7) 42(D7) 48(E7) 110(F7) 220(M7) 240(U7) 380(Q7) 400(V7) 440(R7)								
		V	24(BD) 48(ED) 60(ND) 72(SD) 110(FD) 125(GD) 220(MD) 250(UD) 400(RD)								
Auxiliary contact group (recommended)			     LA1-DN10C LA1-DN01C LA1-DN11C LA1-DN20C LA1-DN02C LA1-DN40C LA1-DN31C LA1-DN22C LA1-DN13C LA1-DN04C 0.1...3S 0.1...30S 10...180S 1...30S LA2-DT0 LA2-DT2 LA2-DT4 LA2-DT2 0.1...3S 0.1...30S 10...180S LA3-DR0 LA3-DR2 LA3-DR4								
Side-mounted auxiliary module LA8-DN11C LA8-DN20C		Plus two groups of instantaneous contacts No increase in box height Other modules can be added to the front of contactor and control relay. Applicable to contactors and control relays below D170					Mechanical interlocking module The design is exquisite, including two sets of NC contacts for mechanical and electrical interlocking, and it is necessary to add NC contacts for electrical interlocking. Applicable to contactors and control relays below D170			LA9-D...02 09- with LCI-D09-D38 LCI-D09-D38 LCI-DO6N-D25N 40- with LCI-D40-D95 115- with LCI-D115-D170	

CJX2
Ac contactor

Coil parameters

Coil voltage (V)	24	32	48	110	127	220	240	380	415	440	480	500	600	660
50Hz	B5	C5	E5	F5	G5	M5	U5	Q5	N5	R5	=	S5	=	Y5
60Hz	B6	=	E6	F6	G6	M7	U6	Q6	N6	R6	T6	=	S6	=
50/60HZ	B7	=	E7	F7	=	M7	=	Q7	N7	R7	=	=	=	=

Outline installation dimension drawing



CJX2-F
Ac contactor



Product overview

- ◇ CJX2-F series AC contactor (hereinafter referred to as contactor) is applicable to 50Hz or 60Hz, equipped with special coil, can be used in circuits with 40~400AC, working voltage up to 660V, and working current up to 630A, for connection and disconnection of main circuit, and for frequent starting and control of motor; It can be used together with various relays and other general electrical equipment for various electrical equipment, motors and circuit control.
- ◇ It can also be combined with auxiliary contact group, air delay head and mechanical interlock to form mechanical interlock contactor and star delta starter, and can also be combined with thermal relay to form magnetic starter. Compliance standard: IEC60947-4-1 GB/T 14048.4.

Model meaning

CJX 2 - F □



Structural features

- ◇ Exquisite and compact structure, modular function, block assembly three-dimensional layout. The contactor is protective type, the action mechanism is direct-acting type, and the contact is double-break point. A mechanical interlocking mechanism can be added between the two contactors to form a mechanical interlocking (reversible conversion contactor) contactor.

Main technical parameters

Model			CJX2 -F115	CJX2 -F150	ZCJX2 -F185	CJX2 -F205	CJX2 -F225	CJX2 -F265	CJX2 -F330	CJX2 -F400	CJX2 -F500	CJX2 -F630
Rated working current Ie(A)	AC-3	380V	115	150	185		225	265	330	400	500	630
		660V	86	107	118		135	170	325	305	355	460
	AC-4	380V	52	60	79		85	105	217	138	147	188
		660V	49	61	69		82	98	118	135	145	170
Maximum power of controllable three-phase squirrel-cage motor pe (kW)	AC-3	380V	55	75	90		110	132	160	200	250	335
		660V	80	125	110		129	160	220	280	335	450
	AC-4	380V	25	30	40		45	55	63	75	80	125
		660V	45	55	63		75	90	110	129	140	160
Agreed heating current(Ith)			200	250	275		315	350	450	500	700	1250
Rated working current (Ue)			380、660									
Rated insulation voltage (Ui)			660									
Meet a criterion			IEC60947、GB14048									
AC-3	Electrical life times		60×10 ⁴		50×10 ⁴				30×10 ⁴		20×10 ⁴	
	Operating frequency		60 ⁰						30 ⁰			
AC-4	Electrical life times		15×10 ⁴						8×10 ⁴		5×10 ⁴	
	Operating frequency						150		1×10 ⁵			
Mechanical life		Time	3×10 ⁵									
Auxiliary contact	Agreed heating current(Ith)		10									
	Electrical life times	AC-15	60×10 ⁴				50×10 ⁴		30×10 ⁴		20×10 ⁴	
		DC-13										

CJX2-F
Ac contactor

CJX2-F115-330 appearance and installation dimensions

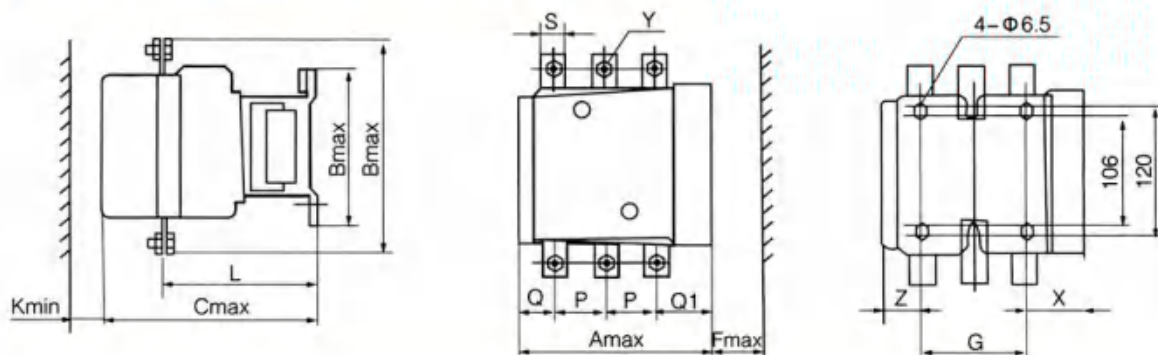


Figure 1

Product model	Amax	Bmax	Blmax	Cmax	G	L	P	Q	Q1	S	X	Z	Y	Fmin	Kmin
CJX2-F115	165	164	137	167	80±0.8	108	37	29.5	60	15	57	26.5	M6×15	133	40
CJX2-F150	165	172	137	167	80±0.8	108	40	26.5	57.5	20	57	26.5	M6×20	133	40
CJX2-F185	171	176	137	181	80±0.8	114	40	30	60	20	59.5	29	M6×20	133	40
CJX2-F205															
CJX2-F225	171	199	137	181	80±0.8	114	48	22	52	25	59.5	29	M6×30	133	40
CJX2-F265	204	205	145	210	96±1.1	143	48	39	66.5	25	61	44.5	M10×30	147	50
CJX2-F330	209	209	145	216	96±1.1	148	48	36	74	25	67	50.5	M10×30	147	60

Note: fmin is the space required to replace the coil, kmin is the minimum electrical distance, and the following is the same.

CJX2-F410 F500 appearance and installation dimensions

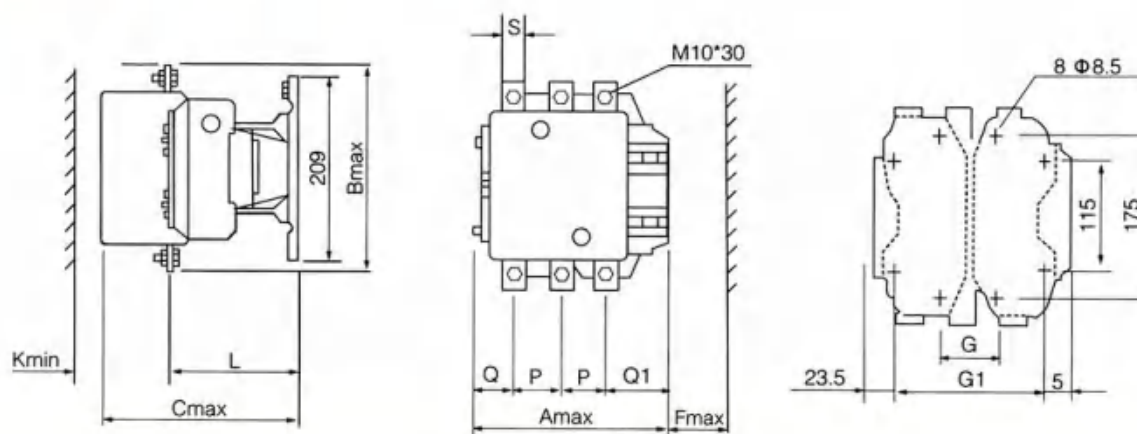


Figure 2

Product model	Amax	Bmax	Cmax	Fmin	Kmin	S	J	L	P	Q	Q1
CJX2-F410	213	206	213	119	70	25	19.5	145	48	43	74
CJX2-F500	233	238	226	141	70	30	39.5	146	55	46	77

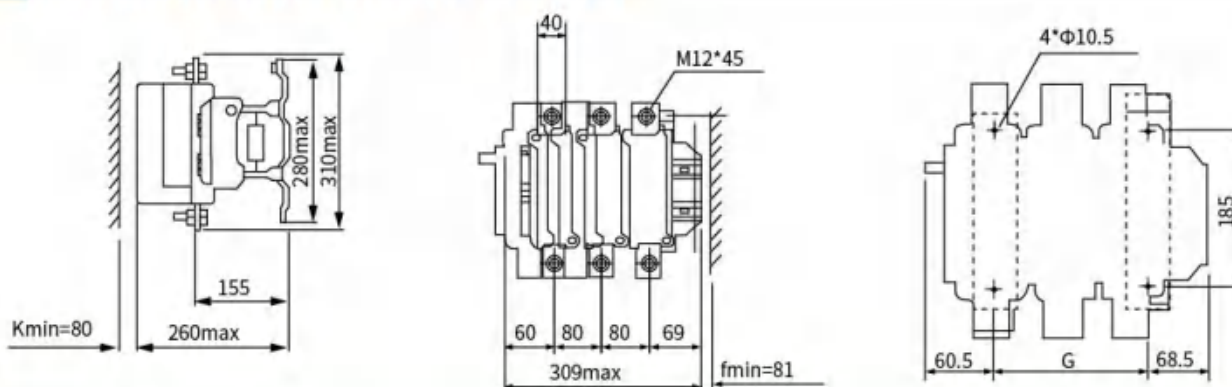


CJX2-F Ac contactor,
F4 auxiliary contact groupAc contactor

CJX2-F410 F500 appearance and installation dimensions

Product model	Size number	Nominal value	max	min
CJX2-F410	G	80	102	66
	G1	170	192	156
CJX2-F500	G	80	120	66
	G1	170	210	156

CJX2-F630 outline and installation dimensions



Size code	Nominal value	max	min
G	180	195	125



F4 Auxiliary contact group introduction

- ◇ The F4 series auxiliary contact can be installed on the top of the CA2 series contact relay to expand the contact pairs. The auxiliary contact group uses the sliding friction contact function to ensure the reliable connection of the circuit. The F4 series auxiliary contact group consists of 8 full specifications, ZF4-11, 20, 13, 31, 22, etc.

F4 Model meaning of auxiliary contact group

ZQ F4 - □ □

Number of normally closed contacts

Number of normally open contacts

Auxiliary contact group

Name of the company

F4 Technical parameters of auxiliary contact group

Number of contacts	Model
2NC	F4-02
1NO+1NC	F4-11
2NO	F4-20
2NO+2NC	F4-22
4NO	F4-40
4NC	F4-04
1NO+3NC	F4-13
3NO+1NC	F4-31

Thermal relay



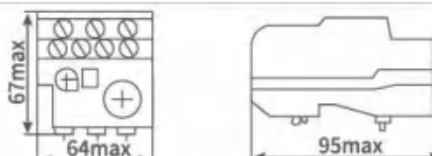
Technical parameter

Number	D1301	D1302	D1303	D1304	D1305	D1306	D1307	D1308	D1310	D1312	D1314	D1316	D1321	D1322
Rated current range	0.1-0.16A	0.16-0.25A	0.25-0.4A	0.4-0.63A	0.63-1A	1-1.6A	1.6-2.5A	2.5-4A	4-6A	5.5-8A	7-10A	9-13A	12-18A	17-25A
Model of matched contactor	CJX2-09 CJX2-12 CJX2-18 CJX2-25 CJX2-32													

Contact parameters

Heating current $I_{th}=10A, I_{NO}+I_{NC}$

Outline and installation dimensions



JR28-25 (LR2-D13)

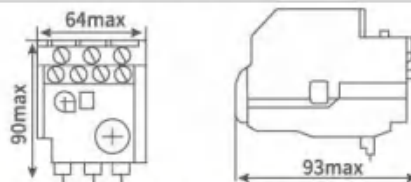


Number	D2253	D2355
Rated current range	23-32A	28-36A
Model of matched contactor	CJX2-32	

Contact parameters

Heating current $I_{th}=10A, I_{NO}+I_{NC}$

Outline and installation dimensions



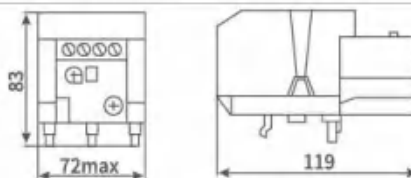
JR28-36 (LR2-D13)/Z

Number	D3353	D3355	D3357	D3359	D3361	D3363	D3365
Rated current range	23-32A	30-40A	37-50A	48-65A	55-70A	63-80A	80-93A
Model of matched contactor	CJX2-40 CJX2-50 CJX2-63 CJX2-80 CJX2-95						

Contact parameters

Heating current $I_{th}=10A, I_{NO}+I_{NC}$

Outline and installation dimensions



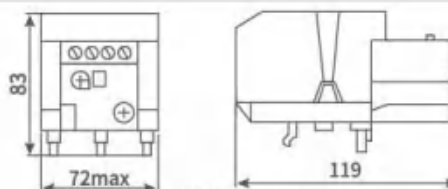
JR28-93 (LR2-D33)

Number	D4365	D4367	D4369
Rated current range	80-104A	95-120A	110-140A
Model of matched contactor	CJX2-115 CJX2150 CJX2170		

Contact parameters

Heating current $I_{th}=10A, I_{NO}+I_{NC}$

Outline and installation dimensions



JR28-93 (LR2-D33)

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overvoltage and
undervoltage

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switch

Load
disconnecter

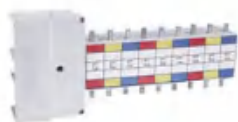
Contactor
thermal relay

Branch/
busbar

BP1

Branch/busbar



BP1
Shunt bus

Product description

- ◇ In the electrical system that meets the installation requirements specified in the German industrial standard VDE 0125 or the International Electrotechnical Commission 60204-1/European Electrotechnical Commission 60204-1/VDE 0113-1 and the International Electrotechnical Commission 60439, the neutral wire, protective ground wire or phase wire are usually connected with the central bus. This requires a clear label on the conductor or junction box of the corresponding circuit.
- ◇ The connection terminal board meets these conditions in two ways:
 - By marking each junction box individually
 - Blue, green-yellow or black housing.

Specification parameter



Model	Connection size (mm) thickness x width	Outline size (mm) thickness x width	Bus size (mm) length × wide × high
BP1-125A/12W	2x5	2x20	180x49x46
BP1-125A/18W	2x5	2x20	234x49x46
BP1-125A/24W	2x5	2x20	288x49x46
BP1-125A/30W	2x5	2x20	342x49x46
BP1-125A/36W	2x5	2x20	396x49x46
BP1-125A/42W	2x5	2x20	450x49x46
BP1-125A/48W	2x5	2x20	504x49x46
BP1-125A/54W	2x5	2x20	588x49x46
BP1-125A/60W	2x5	2x20	612x49x46
BP1-250A/12W	3x5	3x20	180x49x46
BP1-250A/18W	3x5	3x20	234x49x46
BP1-250A/24W	3x5	3x20	288x49x46
BP1-250A/30W	3x5	3x20	342x49x46
BP1-250A/36W	3x5	3x20	396x49x46
BP1-250A/42W	3x5	3x20	450x49x46
BP1-250A/48W	3x5	3x20	504x49x46
BP1-250A/54W	3x5	3x20	588x49x46
BP1-250A/60W	3x5	3x20	612x49x46



Busbar



Specification parameter

- ◇ In the electrical system that meets the installation requirements specified in the German industrial standard VDE 0125 or the International Electrotechnical Commission 60204-1/European Electrotechnical Commission 60204-1/VDE 0113-1 and the International Electrotechnical Commission 60439, the neutral wire, protective ground wire or phase wire are usually connected with the central bus. This requires a clear label on the conductor or junction box of the corresponding circuit.
- ◇ The connection terminal board meets these conditions in two ways:
 - By marking each junction box individually
 - Blue, green-yellow or black housing.



Specification parameter

