



COMPANY INTRODUCES

Seven Star Electric was established in 1995. It is a national high-tech enterprise dedicated to the research, development and production of electric insulation products and high-voltage transmission and distribution products. The main products of the company include ring network cabinets, production and development of smart grid software and hardware (primary and secondary fused column switches, intelligent stations, power clairvoyance, etc.), cable branch boxes, low-voltage complete sets of equipment, cable connectors, cold shrink cable accessories, insulators, lightning arresters, etc. The company has a registered capital of RMB 130 million, fixed assets of RMB 200 million and more than 600 employees. The company has registered capital of 130 million yuan, fixed assets of 200 million yuan and more than 600 employees. 2021, the company will achieve a turnover of 810 million yuan and tax revenue of nearly 30 million yuan. 2022, the annual output value is expected to exceed 1 billion yuan. The company's products have been sold to Vietnam, Philippines, Brazil, South Africa, Singapore, Malaysia and other countries.

In 2022, Quanzhou Tianchi Electric Import & Export Trading Co., Ltd. will be established to serve overseas customers.

TEL:+86-15005059589 Email:Sales1@tianchielectric.com

7 Stars 七星电气
QUANZHOU SEVENSTARS
ELECTRIC CO.,LTD



National ZW32-12F type outdoor high-voltage intelligent divider true air disconnecter

■ Overview

ZW32-12F disconnecter is an outdoor power distribution equipment with rated voltage 12KV induction AC 50Hz. It is mainly used to open and close the load current, overload current and short-circuit current in the power system. The main purpose is to open and close the load current, overload current and short-circuit current in the power system. It is suitable for protection and control in power distribution systems of substations and industrial and mining enterprises, and more suitable for rural power networks and places of frequent operation.

The product can meet the requirements of the automatic system and perform the traditional recloser function reliably and effectively. The switch uses vacuum interrupter as the interrupting medium.



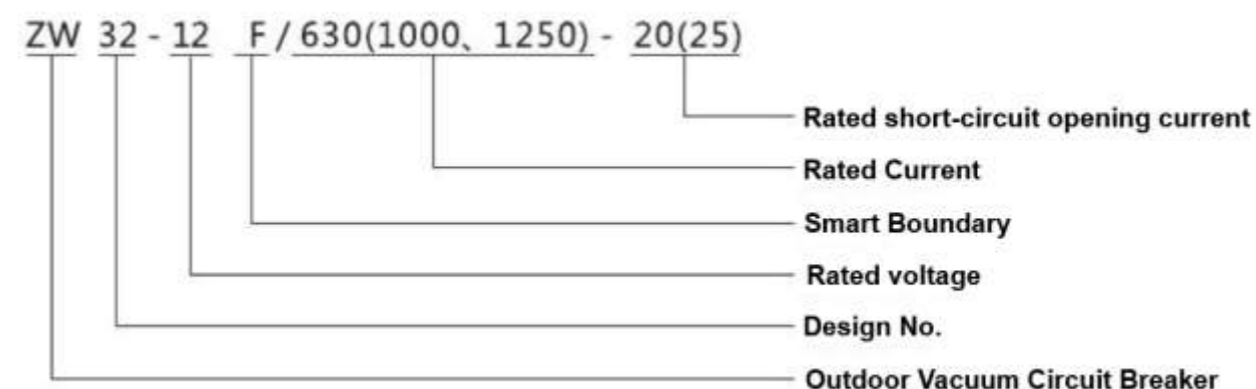
■ Features of the New Pole Switches

ZW32-12F outdoor high-voltage intelligent boundary vacuum circuit breaker (hereinafter referred to as circuit breaker) is an outdoor power distribution equipment with a rated voltage of 12kV and three-phase AC 50Hz. It is mainly used to break and close the load current, overload current and short-circuit current in the power system. It is suitable for protection and control in urban and rural power grids, and is more suitable for places with frequent operations - the circuit breaker cooperates with the intelligent controller BKM600-FDR to form a housekeeper for the distribution network, which is specially designed to solve 10KV user branch grounding and short-circuit faults. In order to avoid power outages affecting the entire feeder due to user branch line faults or improper protection coordination in the distribution network, and reduce liability disputes between power supply departments and users, a user boundary based on user boundary loads and user boundary switch measurement and control units is constructed. Measurement and control system, commonly known as the "house guard" of the distribution network.

■ Three, product features

- 1、 The ideal equipment for urban and agricultural network transformation
The vacuum circuit breaker and intelligent controller can constitute automatic reclosing, realize the function of recloser, as well as remote control, telemetry, telematics, telecontrol.
- 2、 Flexible and convenient operation
The product is electric energy storage, electric division and closure, and also has manual energy storage, manual division and closure, and can be near or long-distance arrested control operation.
- 3、 Excellent opening and breaking performance
Open short-circuit current 20KA (25KA) up to 30 times.
- 4、 small operating power, high reliability.
The new design of small electric spring mechanism, the number of parts of the operating power (about 30W) are reduced to the lowest level.
- 5、 Maintenance-free feature.
The secondary components of the circuit breaker and the operating mechanism are sealed in the box and are not affected by the external environment.
- 6、 Reliable sealing performance
Adopting mature sealing structure technology, the sealing performance is reliable

■ Model number and meaning



■ Environmental conditions of use

1. The altitude should not exceed 3000m;
2. Ambient air temperature: -40°C~+40°C; Daily temperature difference: daily temperature change 25 °C;
3. The wind speed is not greater than 35my/s;
4. No flammable, explosive hazard, strong chemical corrosion (such as various acids, alkalis or dense smoke, etc.) and places with severe vibration.

■ Main technical parameters(Table - 1)

No.	Items	unit	Numerical value
1	Rated Voltage	KV	12
2	Rated Frequency	Hz	50
3	Rated current	A	630, 1000, 1250
4	Rated short-circuit opening current	KA	20, 25
5	Rated peak withstand current (peak)	KA	50, 63
6	Rated short time withstand current (4s)	KA	20, 25
7	Rated short-circuit closing current (peak)	KA	50, 63
8	Mechanical life	times	10000
9	Rated current Number of openings	times	10000
10	Rated short-circuit breaking current Number of breaks	times	30
11	Frequency withstand voltage (1min): phase to phase, ground to ground/breakout	KV	42/49
12	Lightning impulse withstand voltage (peak) phase to phase, ground to ground / fracture	KV	75/85
13	Secondary circuit 1min frequency withstand voltage	KV	2
14	Net weight	kg	85/105 (with isolation)

■ Mechanical characteristics parameters(Table - 2)

No.	Items	unit	Numerical value
1	Contact opening distance	mm	9±1
2	Contact overtravel	mm	2±0.5
3	Breaking speed	m/s	1.2±0.2
4	Closing speed	m/s	0.6±0.2
5	Contact closing bounce time	ms	≤2
6	Center distance between phases	mm	340±1.5
7	External energized air insulation distance	mm	≥240±2
8	External pickup distance	cm/kV	3.8
9	Three-phase readings are not simultaneous	ms	≤2
10	Conductive circuit resistance of each phase	μΩ	<80/120 (with isolation)
11	Closing time	ms	≤45
12	Breaking time	ms	≤45
13	Isolation break opening distance	mm	≥200
14	Contact knife just closed position deviation	mm	≤2
15	Manual breaking and closing operation torque	N.m	≤150
16	Rated power of energy storage motor	W	>40
17	Rated voltage of energy storage motor	V	AC220
18	Rated closing operating voltage	V	AC220
19	Maximum/minimum closing operating voltage	V	AC264/143
20	Rated dividing operating voltage	V	AC220
21	Highest/minimum split reading operating voltage	V	AC264/143
22	Maximum/minimum motor voltage	V	AC242/187

The product is operated from a low-voltage AC/DC220V (110V) power source supplied by the user or from a secondary voltage of AC220V (110V) directly connected to a voltage mutual inductor (external) from an overhead line.

The source. Built-in protection, zero-sequence current mutual inductor three, the ratio of 600/1.

■ Product Structure

The product consists of four parts: circuit breaker body, operating mechanism, intelligent controller and power supply PT.

Circuit breaker body structure

ZW32-12F circuit breaker is composed of high voltage system and arc extinguishing device of its operating parts, operating mechanism and chassis for installation, fixing and moving (hanging). Install the isolating switch, the appearance is shown in Figure 2. The circuit breaker is a new miniaturized design. Fully enclosed structure, unique arc extinguishing chamber packaging technology, good sealing performance, moisture-proof, anti-condensation, suitable for high temperature and humid areas.

The breaking performance of the circuit breaker is stable and reliable, and it has the characteristics of no combustion and explosion hazards, safety, maintenance-free, small size, light weight, and long service life.

The circuit breaker is conveniently connected to the intelligent switch controller through the aviation plug, and the intelligent switch controller is equipped with multiple protection functions such as three-stage current protection, zero-sequence protection, coincidence reading, and quick-break protection. It can support a variety of communication protocols, and people are allowed to choose a variety of communication methods to form a communication network. It can not only operate the switch locally manually or remotely, but also realize remote control through the communication network.

The operating mechanism is sealed in the case, which can effectively avoid the mechanism corrosion caused by the long-term outdoor environment of the switch.

The operating mechanism is novel, simple, reliable, small in size, and the life of the chassis can reach 10,000 times.

Circuit breaker installation method, using the column seat type installation .

The structure of the combined circuit breaker is mainly composed of contact blades, brackets, insulating pillars, pull rods and rotating shafts, etc. combined with the circuit breaker. There is a mechanical interlock between the circuit breaker and the isolating switch, which has the function of preventing misoperation. The functions of the mechanical interlock are:

- a When the circuit breaker is in the closing position, the disconnecter cannot be opened; only after the circuit breaker is opened, the disconnecter can be opened;
- b. When the isolating switch is in the opening position, the circuit breaker cannot be closed; only after the isolating switch is closed, the circuit breaker can be closed.

■ Operating mechanism

This product is electric energy storage, electric opening and closing, and also has manual energy storage, manual opening and closing, over-current protection, the whole structure consists of closing spring, energy storage system, over-current release, opening and closing coil, manual opening and closing Reading system, auxiliary switch and energy storage indication and other components.

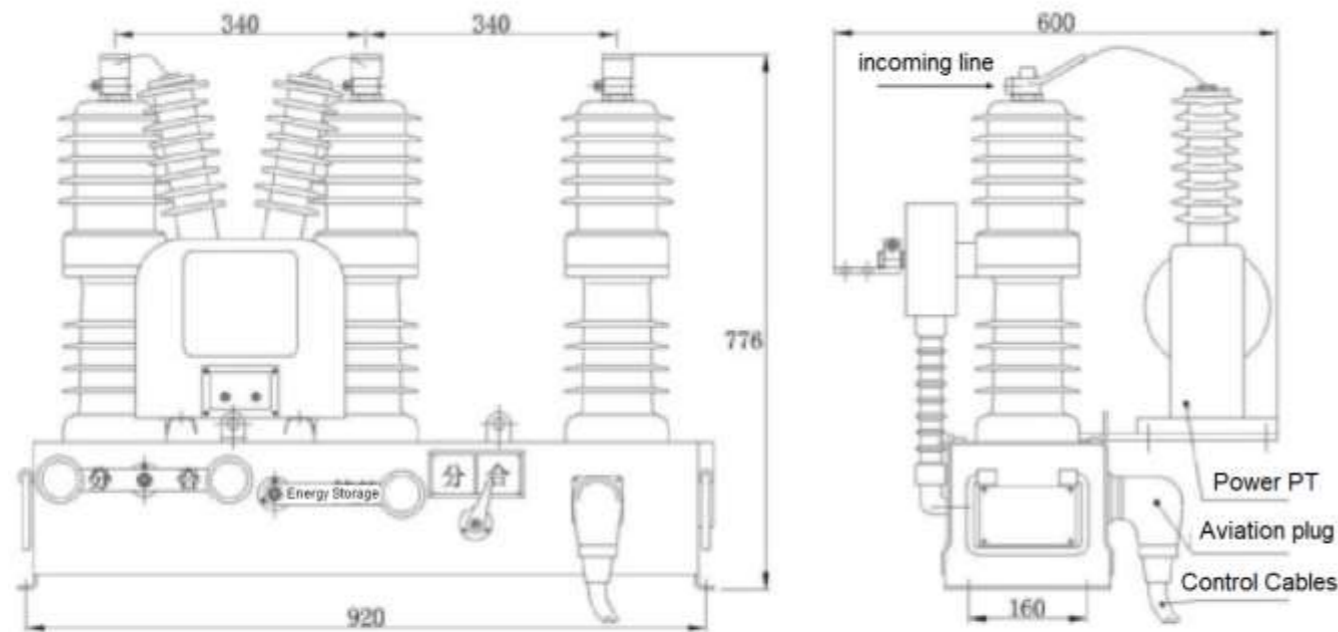


Figure 1. Circuit Breaker Installation Dimensions

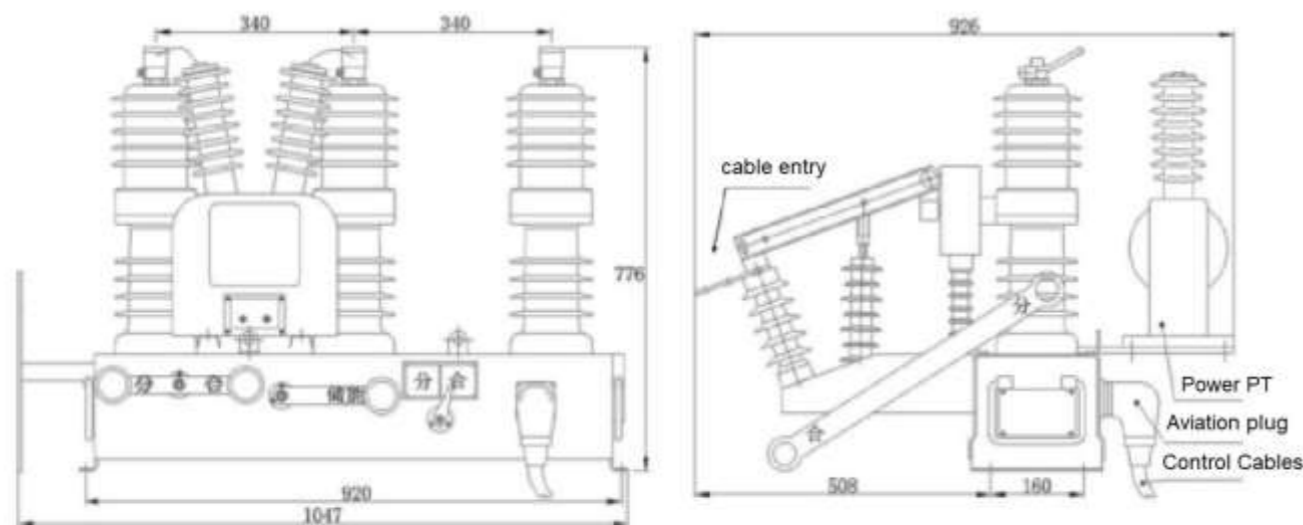


Figure 2, circuit breaker installation dimensions (with disconnect switch)

■ Action Principle

Energy storage process .

Pull the mechanism manual energy storage pull ring, or give the mechanism electric energy storage signal, the motor drives the energy storage arm to store energy to the energy storage spring, and maintain this energy through the energy storage holding loop.

Closing process.

When closing the circuit breaker, pulling the manual closing ring or giving the electric closing signal to the machine, the closing spring energy is released, the output shaft of the machine rotates, and the moving contact of the interrupter is moved upward through the inflection arm and the driving linkage plate to contact the static contact and provide contact pressure, while storing energy for the breaking spring and keeping the circuit breaker in the closed state through the normal buckling of the closing holding loop of the machine.

Breaking process.

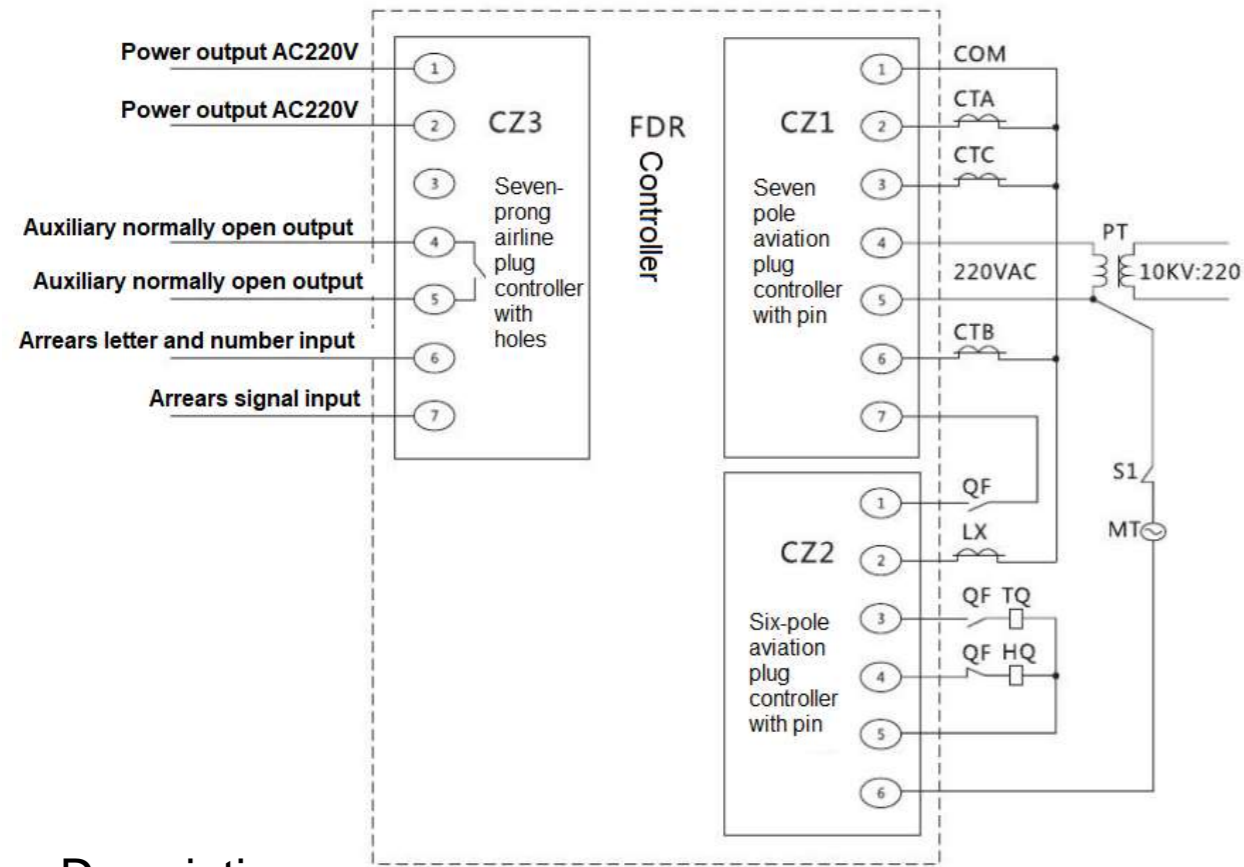
When the circuit breaker is broken, the manual breakout ring of the mechanism is pulled or the electric breakout signal is given to the mechanism, and the closing retaining ring of the mechanism is unlocked. The breaking state is maintained by the switch breaking spring.

Overcurrent protection process .

When the current flowing through the main circuit of the interrupter exceeds the rating of the interrupter, the current output from the secondary side of the interrupter will signal the controller, and the controller will give the operating voltage to the breaking coil, causing the interrupter to break.

■ Connection between controller and switch

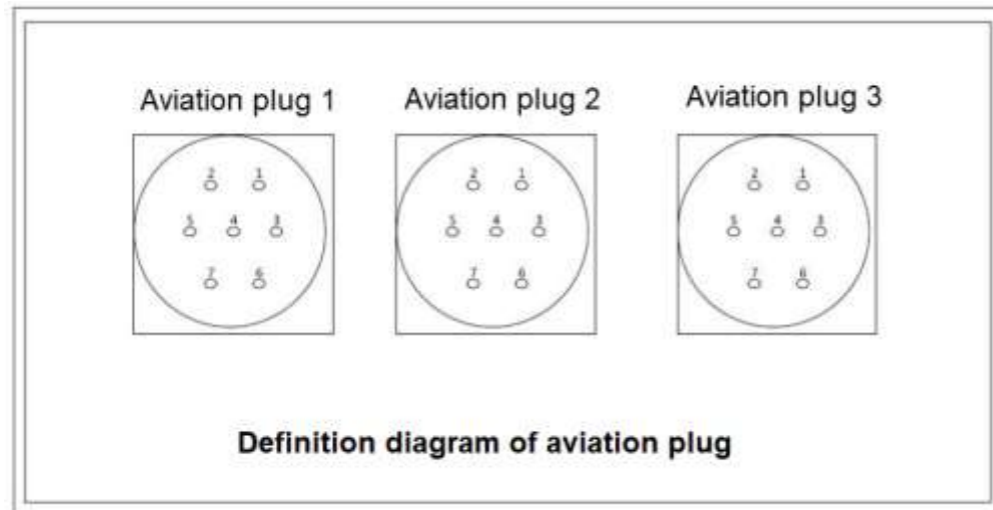
BKM600-FDR Controller Wiring Diagram



Description:

CTA is A-phase CT; CTB is B-phase CT; CTC is C-phase CT; LX is zero-sequence CT. TQ is the breaking coil; HQ is the closing coil; Q is the breaker auxiliary switch. MT is energy storage motor; S is energy storage auxiliary switch; PT is voltage mutual inductor

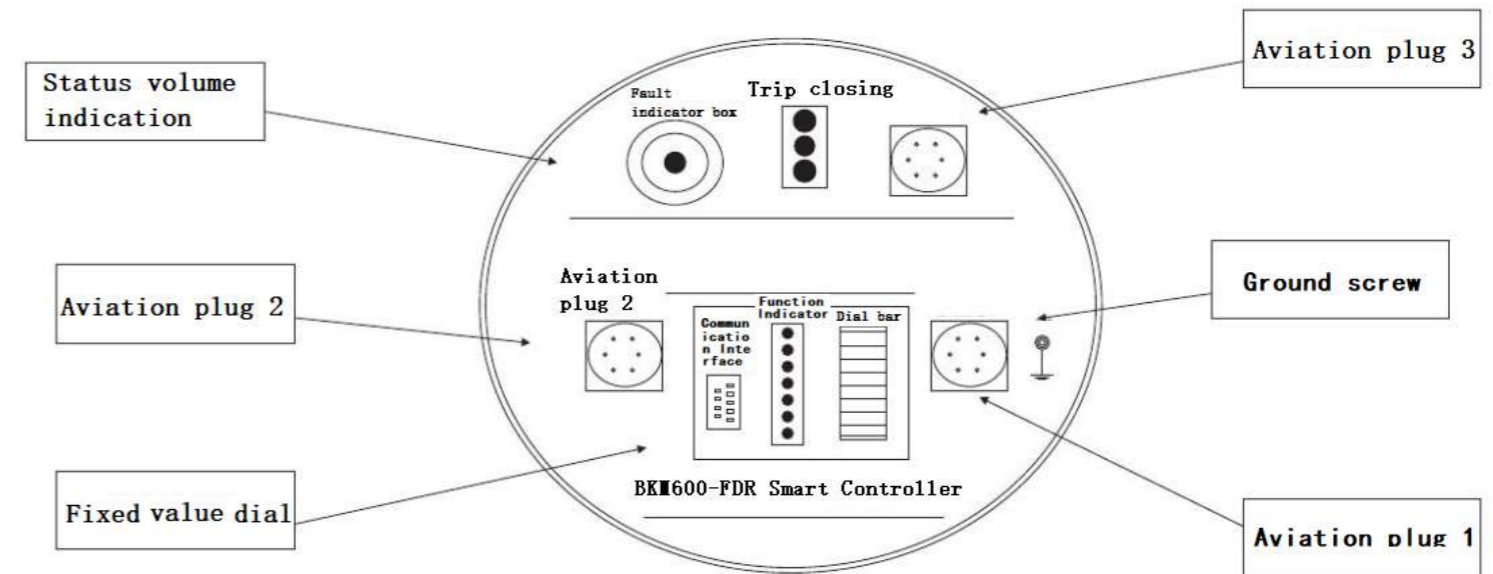
Aviation plug connection



■ Aviation plug pin definition table

aviation plug 1		aviation plug 2		aviation plug 4	
pin	Input and output signals	pin	Input and output signals	pin	Input and output signals
1	Protection current CT Common terminal	1	breaker location	1	Power output AC-L
2	Protection current IA in	2	Protection current IO in	2	Power output AC-N
3	Protection current IC In	3	Trip control output	3	null
4	Device power supply AC-L	4	Closing control output	4	Auxiliary output common terminal
5	Device power supply AC-N	5	Control power supply KM-	5	Auxiliary output
6	Protection current IB in	6	Energy storage motor power supply AC-L	6	Arrears open into the public terminal
7	Open to common terminal	7		7	Arrears jump spoke output

After the BKM600-FDR controller is installed on the pole, please connect the aviation plug according to the marked position on the panel, tighten the grounding bolt and ensure reliable grounding. Refer to the Plug Plug Pin 1 and 2 Definitions table for wiring definitions.



Schematic diagram of BKM600-FDR device panel

■ Instructions for color high-brightness LED lights

Indicator light classification		Description of the indicator status
overcurrent	Red	Overcurrent action indicator light is on
to run	Green	The normal indicator light of the device is on
quick break	Blue	The quick-break action indicator light is on
zero sequence	Yellow	Zero sequence action indicator light is on

Note: The working status of the controller can be determined by observing the various color indicators on and off at the bottom of the controller, and the SOE event log can be accessed through the LCD panel.

Control power supply and opening and closing control voltage

The power supply of BKM600-FDR controller comes from the high-voltage transformer, the rated voltage of the power supply is AC220V, 50HZ, after the aviation plug of the power supply is connected, the controller automatically enters the working state, and the controller has a built-in 2A-6A fuse.

On-column switch The energy storage motor is powered by PT voltage, which is connected to the on-column switch after passing through the controller.

The BKM600-FDR controller has its own internal energy storage capacitor, and the opening and closing energy comes from this capacitor. In order to avoid the influence of line voltage fluctuations on the opening and closing operation, the opening and closing control circuitThe output voltage of the circuit is DC220V DC voltage. When the circuit voltage drops suddenly, the capacitor can provide a time not less than 8S to maintain the work of the BKM600-FDR controller and reclose once.

Note: The BKM600-FDR controller adopts a voltage-stabilizing charging method to ensure that the energy storage capacitor is around DC220V, and the charging time of the capacitor is less than 0.5S.

■ Dial code operation

Select the band according to the dial table, and the corresponding value is the fixed value and time limit required by the user. The list is as follows: 5S.

Dialing code value	0	1	2	3	4	5	6	7	8	9
Speed break value A (once)	NC	300	450	600	900	1200	1800	2400	3600	5000
Overcurrent value A (once)	NC	50	75	100	150	200	300	400	500	600
Overcurrent time S	0.1	0.2	0.3	0.5	1	2	3	4	5	10
Number of re-closing times	0	1	2	3	3	3	3	3	3	3
One time S	0.3	0.5	1	2	3	5	10	20	30	600
Two or three times time S	5	6	7	8	9	10	20	30	100	600
Zero sequence value A	NC	0.03	0.05	0.06	0.07	0.1	0.15	0.2	0.3	0.5
Zero sequence time S	0.1	0.2	0.5	1	2	5	10	100	3600	7200

■ Three-stage overcurrent protection

Setting value Setting range: 0.10A~99.99A

Accuracy: $\pm 3.0\%$

Delay: 0~99.99S

Protection action time: under 1.2IN, the setting action time is less than 40MS

Action conditions: When the overcurrent stage I pressure plate is switched on, when any protection current $>$ I stage start value (IZD1), the protection will act after the time T1 passes, and trip the circuit breaker;

When the pressure plate of the overcurrent stage II is switched on, when any protection current $>$ the starting value of stage II (IZD2), the protection will act after the time T2 elapses, and the circuit breaker will be tripped;

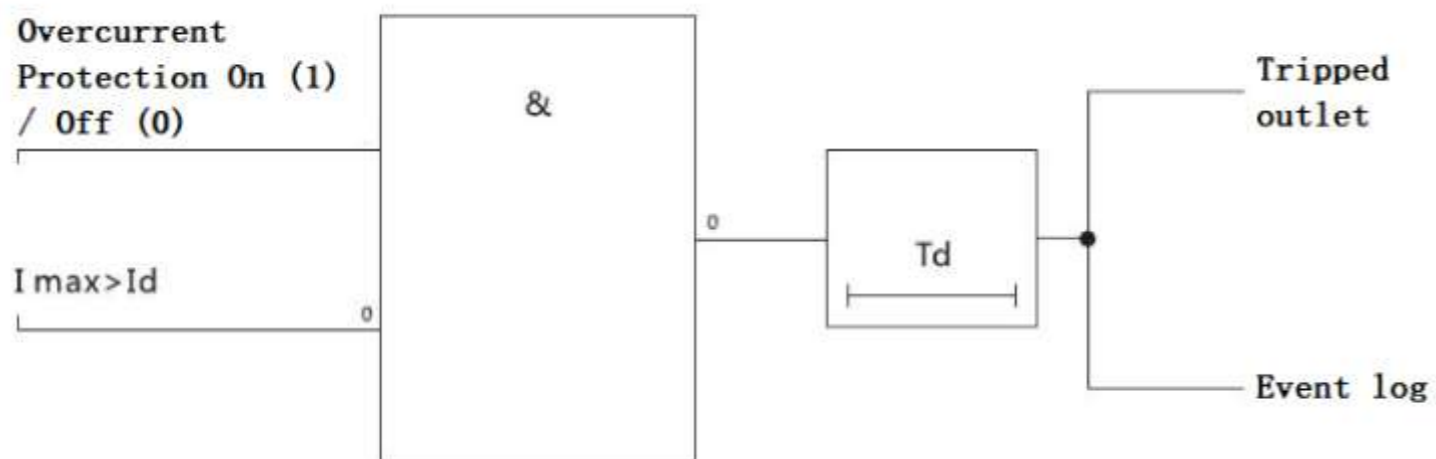
When the pressure plate of overcurrent stage III is switched on, when any protection current is $>$ the starting value of stage III (IZD3), the protection will act after time T3 and trip the circuit breaker;

Overcurrent stage I: quick break protection

Over-current stage II: time-limited quick-break protection

Overcurrent stage III: overcurrent protection

Protection Logic Diagram .



■ Zero sequence overcurrent protection

Zero-sequence current protection adopts special zero-sequence CT connection.

Setting value Setting range: 0.10A~9.99A

Accuracy : Up +0.5% Delay: 0~3600S

Protection Logic Diagram :

Zero sequence overcurrent protection (I₀>)

