

# LW36-126

Self-Energy High Voltage  
SF6 Circuit Breaker

Honorary Presentation of BBE





### I. Introduction

The model LW36-126 self-extinguishing high voltage SF6 circuit breaker is appropriate for electrical power systems of AC 50HZ, 126KV, especially appropriate for switching the power supply of important applications. It can be utilized as control and protection switches of the power distribution systems of power stations and transformer stations, and as circuit breaker of electrical power systems.

### II. Working Conditions

a. Ambient Temperature:  $-25^{\circ}\text{C}\sim+40^{\circ}\text{C}$

b. Altitude:  $\leq 2,000$  meters

c. Wind Velocity :  $\leq 34\text{m/s}$

### III. Rated Technical Parameters

1. The rated technical parameters of the circuit breaker are as follows:

No	Item		Unit	Parameter
1	Rated Voltage		kV	126
2	Rated Power-Frequency Withstand Voltage (1min)	To Earth	kV	230
		Between Breaks		230
3	Rated Lighting Impulse Withstand Voltage	To Earth	kV	550
		Between Breaks		550
4	Power-Frequency Withstand Voltage at Zero SF6 Pressure (5min)		kV	95
5	Rated Frequency		Hz	50
6	Rated Current		A	3150
7	Rated Short-Circuit Breaking Current		kA	40
8	Rated Peak Withstand Current		kA	100
9	Rated Short-Time Withstand Current		kA	40
10	Rated Short-Circuit Making Current		kA	100
11	First-Pole-To-Clear Factor			1.5
12	Rated Duration of Short Circuit		S	4
13	Rated Out of Phase Breaking Current		kA	10
14	Short Line Fault Breaking Current		kA	36 , 30
15	Line-Charging Switching Current		A	31.5
16	Rated Operation Sequency			O-0.3s-CO-180s-CO
17	Radio Interference Level		$\mu\text{V}$	$\geq 2500$
18	Annual Air Leakage Factor		%	$\geq 1$
19	Rated Pressure of SF6 (20°C)		MPa	0.6
20	Alarm/Locking Pressure (20°C)		MPa	0.55/0.50
21	Alarm/Locking Release Pressure (20°C)		MPa	0.58/0.53
22	Gas Moisture		ppm(v)	$\geq 150$
23	Mechanical Life		Time	6000
24	Creepage Distance	To Earth	mm	3150
		Between Breaks		3150
25	Resistance of Main Circuit		$\mu\Omega$	$\geq 45$
26	SF6 Quantity per Circuit Breaker		Kg	10
27	Stationary Tension of Terminals	Longitudinal	N	1250
		Horizontal		750
		Vertical		1000

d. Daily Temperature Variation:  $\geq 35^{\circ}\text{C}$

e. Sunlight Intensity:  $\geq 1000\text{w/m}^2$

f. Monthly Mean Relative Humidity:  $\geq 90\%$

g. Seismic Acceleration: H  $\geq 0.2\text{g}$ , V  $\geq 0.1\text{g}$

h. Thickness of Covered Ice:  $\geq 10\text{mm}$

i. Level of Air Pollution : not higher than level III of GB5582

j. Installation Environment: Outdoor or Indoor

\* Special requirements are determined through negotiation.

## 2. Rated Technical Parameters of Spring Devices



No	Item		Unit	Parameter
1	Auxiliary Circuit Voltage		V	DC220 or AC220
2	Voltage of Switch On & Off Coil		V	DC220
3	Current of Switch On & Off Coil		A	3; 2
4	Energy Storage Motor	Rated Voltage	V	DC220 or AC220
		Variation Range	V	80%-110%
		Power	W	720
5	Time of Energy Storage		S	$\geq 20$
6	Manual Storage Moment		N.m	$\geq 20$
7	Voltage of Heater and Lamp Circuit		V	AC220
8	Rated Voltage of Auxiliary Switch		V	DC220 or AC220
9	Rated Current of Auxiliary Switch		A	10
10	Number of Pairs of Contact Points of Auxiliary Switch			11 Openings & 11 Closings

## 3. The Adjustable Range of Mechanical Parameters

No	Item	Unit	Parameter	
1	Central Distance between Circuit Breakers	mm	1700 ± 5	
2	Stroke of Movable Contacts	mm	120 <sup>+ 3</sup> <sub>0</sub>	insured during assembling process
3	Contact Stroke of Movable Contacts	mm	27 <sup>+ 3</sup> <sub>0</sub>	
4	Range of Operation Rod (Chord)	mm	110 <sup>+ 3</sup> <sub>0</sub>	
5	Open Operation Velocity	m/s	4.7 <sup>+0.3</sup> <sub>-0.2</sub>	
6	Close Operation Velocity	m/s	3.5±0.5	
7	Open Operation Time	ms	40 <sup>+2</sup> <sub>-5</sub>	
8	Close Operation Time	ms	75±10	
9	Asynchronism of 3-Phase Open Operation	ms	≧ 3	
10	Asynchronism of 3-Phase Close Operation	ms	≧ 5	

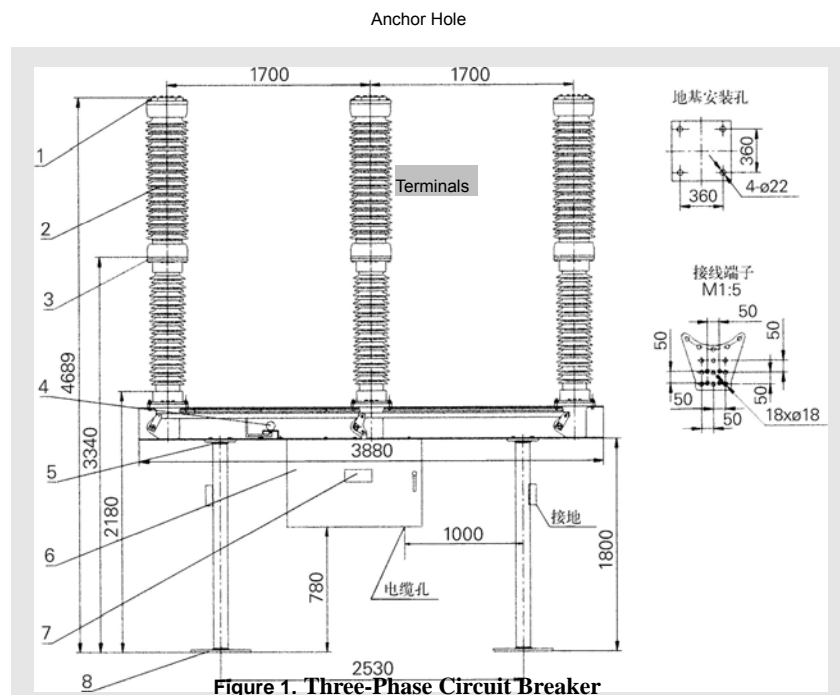


Figure 1. Three-Phase Circuit Breaker

1. Upper Terminal 2. Phase Pole 3. Lower Terminal 4. Density Scale 5. Base 6. Control Box 7. Rating Plate 8. Anchor

## IV. Product Construction and Working Principle

### 1. General Constuction

The circuit breaker adopts single-phase single-break construction. The three phase poles of each circuit breaker are installed on a common base and are driven by a spring mechanism to realize opening and closing of said three phrase poles. The spring mechanism and the electrical control unit are installed in the same cabinet that is fixed at the bottom of foundation B (see figure 1). The gas chambers of three phrase poles are connected with pipelines via valves. The pressure of SF6 in the gas chamber is monitored and displayed by the density relay with temperature compensation function.

### 2. Construction Features of Phrase Poles of Circuit Breaker

The circuit breaker altogether has three phrase poles: A, B ,C. Except that the outer elbow of pole B is dual-elbow, the three phrase poles are identical.

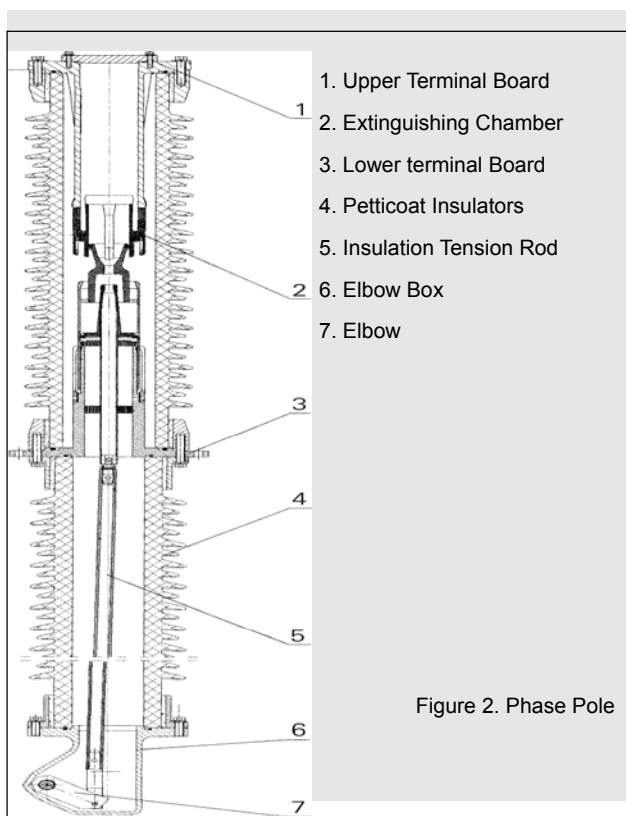


Figure 2. Phase Pole

Each phrase pole mainly consists of the extinguishing chamber, petticoat insulator support, insulating tension rod, elbow box, etc (see figure 2). There is absorbent in the elbow box. The extinguishing chamber and petticoat insulator support are made of high strength porcelain of high gas tightness strength.

### 3. Construction of Extinguishing Chamber and Its Working Principle

The extinguishing chamber is mainly composed of extinguishing petticoat insulator, movable and stationary contacts, nozzle, expansion cylinder, etc (see figure 3).

The extinguishing chamber adopts auto-expansion arc-extinguishing mechanism to switch large current. The arc-extinguishing pressure for small current is generated by the SF6 gas in the heat compression cylinder. When the current is not zero, the SF6 gas in the heat expansion cylinder blows to the electric arc to extinguish it.

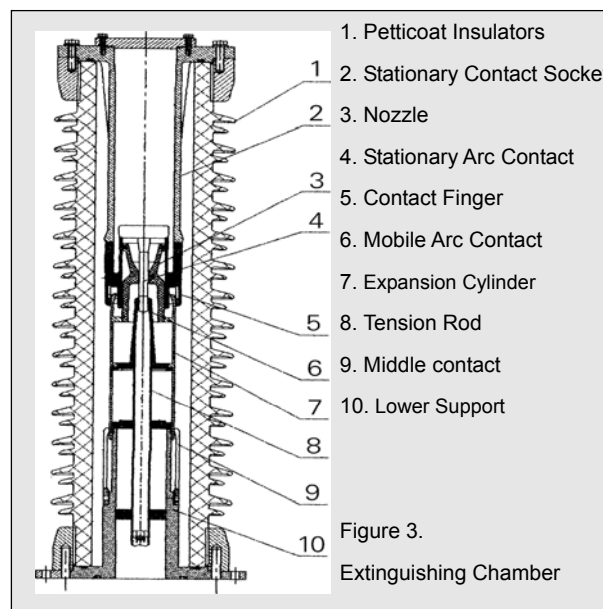
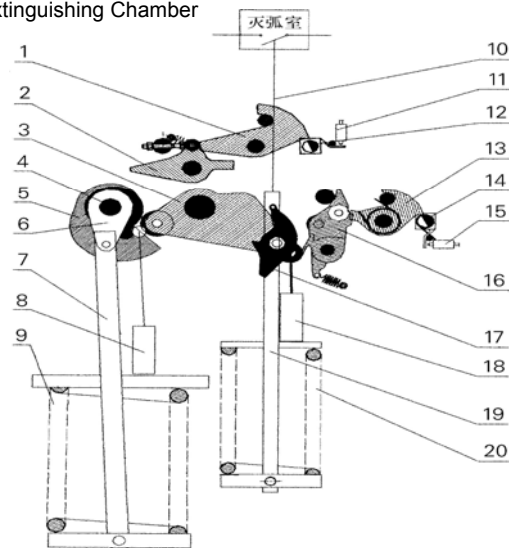


Figure 3.  
Extinguishing Chamber

### Extinguishing Chamber



1. Closing Fan Plate 2. Energy Storage Latch 3. Output Elbow 4. Energy Storage Shaft 5. Cam 6. Elbow 7. Closing Tension Rod 8. Closing Buffer 9. Closing Spring 10. Output Rod 11. Closing Magnet 12. Closing Semi-Shaft 13. Opening Fan Plate 14. Opening Semi-Shaft 15. Opening Magnet 16. Closing Latch 17. Closing Driving Block 18. Opening Buffer 19. Opening Tension Rod 20. Opening Spring

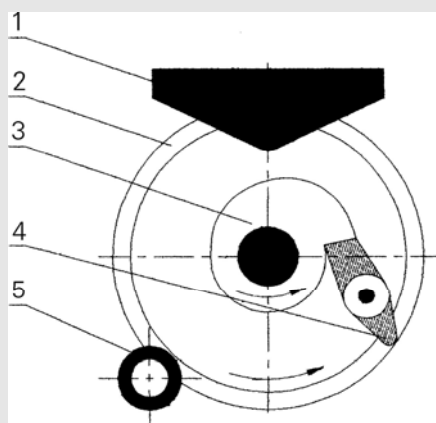
Figure 4 Mechanism Transmission Diagram (The circuit breaker is in open state and close operation spring does not store energy.)

#### 4. The Spring Mechanism and Its Operating Principle

The spring mechanism is composed of opening and closing electro-magnets, opening and closing semi-shafts, opening and closing fan plates, opening and closing springs, cam, energy storage shafts, output elbows, output tension rod, etc (see figure 4).

##### (1) Energy Storage of Closing Spring

As shown in Figure 5, the energy storage motor 5 drives the bull gear 2 to rotate and the energy storage pawl 4 on the bull wheel turns the eccentric wheel 3 fixed on the energy storage shaft to the upper dead end. When the energy storage shaft continuously revolves through the dead end, because the release power by the closing spring can turn the energy shaft faster than the velocity of pawl 4, the eccentric wheel 3 and pawl 4 disengages and the cam disposed on the energy storage shaft is blocked by the energy storage latch, which renders the energy storage shaft stops rotating.



1. Energy Storage Limit 2. Bull Gear 3. Eccentric Wheel  
4. Energy Storage Driving Pawl 5. Energy Storage Motor

Figure 5. The functional scheme of energy storage pawl

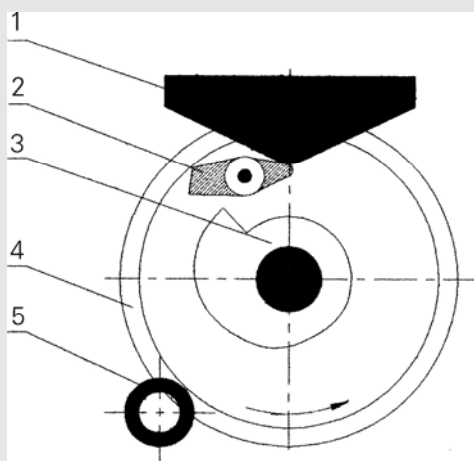


Figure 6. The function scheme of energy storage limit

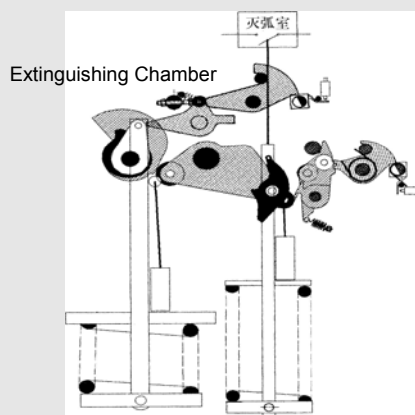
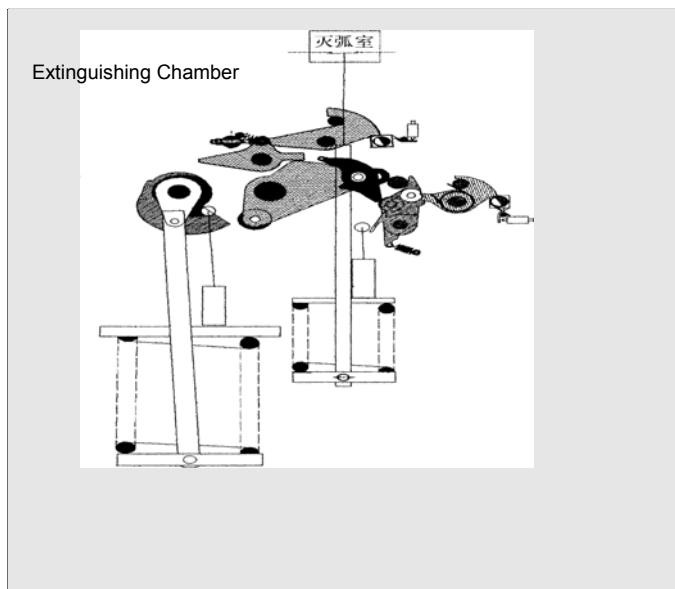


Figure 7 The circuit breaker is in open state (close operation spring has stored energy)

As shown in Figure 6, before the energy storage shaft stops at 10 degrees of the upper dead end, the energy storage limit plate 1 which is fixed in the mechanism box makes the pawl 2 separate from the eccentric wheel 3 on the stored energy axis, thus the stored energy axis and bull wheel 4 separate, the electric motor the automatic turnoff power source and brings the gear after the stored energy axis upper dead center position to decelerate together stops transfers, switches on the spring stored energy to finish, holds the drive mechanism to prepare to switch on the operation (see figure 7)

##### (2) Closing Operation

As shown in Figure 7, the closing electro-magnet 11 acts to make the closing semi-shaft 12 turn clockwise; the closing fan board 1 is released together with the energy storage latch 2, which makes the energy storage shaft 4 turn clockwise driven by the closing spring 9; the knee 6 disposed on the energy storage shaft passes over the lower dead end driven by the closing tension rod 7 from the energy storage location and rotates together with the energy storage shaft with cam; meanwhile the large cam drives the roller on the output knee to make the output knee rotate anti-clockwise and complete the closing operation via the output rod 10. At the same time, the opening spring 20 stores energy via opening tension rod 19. Consequently the roller moves to the back end of the small cam to prevent the energy storage shaft turning reversely. When the output knee separates with the big cam, it slightly rotates back in the direction of closing operation until the closing driving block is limited onto the roller of closing operation latch, which keeps the circuit breaker in closing state (see figure 8).



**Figure 8.** The circuit breaker is in close state (close position spring un-stored energy and open position spring stored energy.)

During the process of closing operation, the energy motor is powered on; see section IV.4.1 for the energy storage process of the closing operation spring (see figure 9).

### (3) Opening Operation

As shown in Figure 9, the closing electromagnet 15 operates to make closing operation latch 16 disengage with output knee 3 by virtue of opening semi-shaft 14 and opening fan board 13. Opening spring 20 drives output knee 3 via the opening tension rod 19 to the opening position; meanwhile the contact in the extinguishing chamber is moved to the opening location by the output rod.

Finally the kinetic energy generated by the opening movement is gathered by the opening buffer that also performs the function of completely stopping the movement of the mechanism.

### (4) Re-closing Operation

When the circuit breaker is in closing position and both the closing and opening springs have stored energy, the circuit breaker can continuously perform the O-0.3s-CO re-closing operation. After the re-closing operation the circuit breaker in opening-deenergized state and thus can repeat the closing-energy-storing process as described above.

### (5) Manual Operation

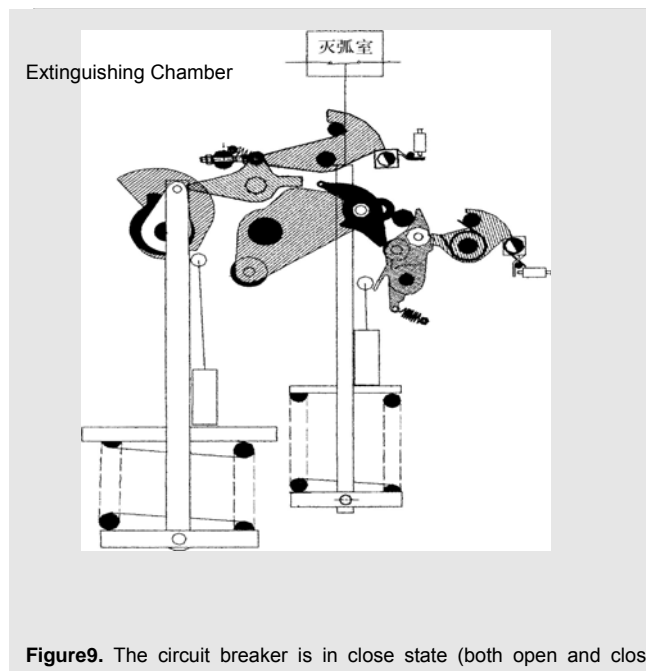
The opening and closing operation of the mechanism can be realized either electrically or manually.

## 5. Control Circuit

Figures 10a and 10b are the electrical control schemes of the circuit breaker.

The signals produced by the electrical components of the circuit breaker are as follows.

- (1) SF6 Supplement Alarm ;



**Figure9.** The circuit breaker is in close state (both open and close operation springs have stored energy.)

- (2) SF6 Locking Alarm;

- (3) Motor Energy Storage Failed Signal or Energy Storing Signal;

- (4) Motor OT Fault Alarm;

- (5) Motor Energy Storage Success Signal.

## V. Packaging and Transportation

The three phase poles are packaged in one box and the base and transmission mechanism thereof are packaged in another one. During the transportation and storage period, aerate the circuit breaker with SF6 to the pressure of 0.03 MPa to prevent impurities and water vapor from entering into it.

## VI. Open case

1. When unpacking the packages, check the packaged components, documents and their quantity according to the packing list.
2. Do not damage the porcelain insulator when unpacking the boxes.
3. Before installing and aerating the circuit breaker, all valves of the circuit breaker should be in closed state; do not remove the protection caps disposed at the ends of pipelines to prevent impurities and water vapor from entering the circuit breaker.

## VII. Installation and Debugging

### 1. Installation Preparation

A crane of 3-ton lifting capacity and 5-meter lifting height is needed for installation.

\* Check the sizes of the installation foundation.

\* All anchor bolts should be prepared by the users.

Improperly craning the package, incorrect bolts or fastening manner may damage the equipment or induce human injuries. Utilize the fastening parts in the spare box supplied by the manufacturer and tighten them with torque spanners.

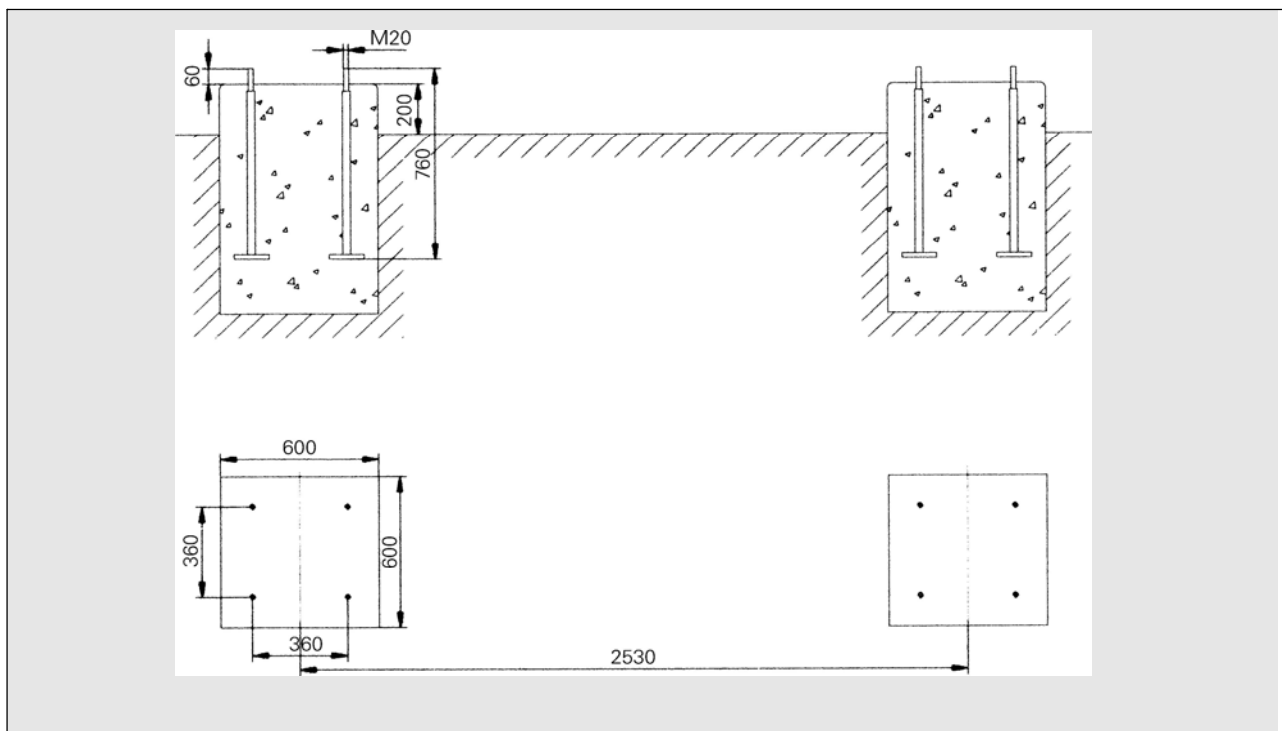


Figure 10. Foundation Installation

The specified torque for different bolts are as follows:

M6  $8 \pm 1\text{Nm}$  M12  $70 \pm 7\text{Nm}$

M8  $22 \pm 2\text{Nm}$  M16  $200 \pm 20\text{Nm}$

M10  $45 \pm 5\text{Nm}$  M20  $400 \pm 40\text{Nm}$

The impact forces of the circuit breaker while operating are 25,000 N for opening operation (upward) and 15,000 N for closing operation (downward). Thoroughly clean the porcelain insulator before installing the circuit breaker and avoid impacting it during the craning process. Adopt step ladders or elevators to install the circuit and do not incline the ladders against onto the phrase poles. Invite proficient specialist as guide during the installation process.

- Before installing the circuit breaker, check if the anchor bolts (8-M20×600/GB799-88) are in accordance with the specifications and the length of the extended part of the bolts meets the specified requirements. Check the levelness of the foundation with level meter and the height difference between the surfaces of two foundations should be less than 2 mm (see figure 10).

## 2. Installation of Base

The circuit breaker base and the operating mechanism pack the exwork together, after hitting foundation like figure 10, lifts with the hoisting equipment the base module to the ground see figure 11, sse 8 nuts M20 to fix it in the ground. After the base installs the fastening, adjusts the base plane with the horizon, levelness should not be bigger than 2mm.

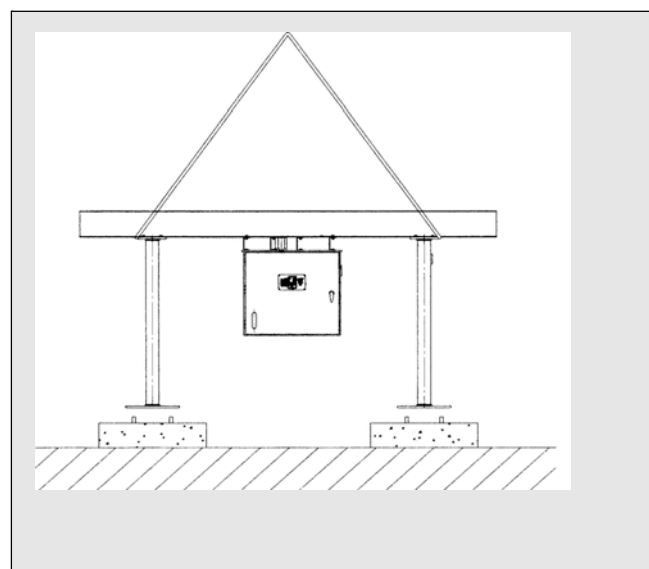


figure 11. Base Installation

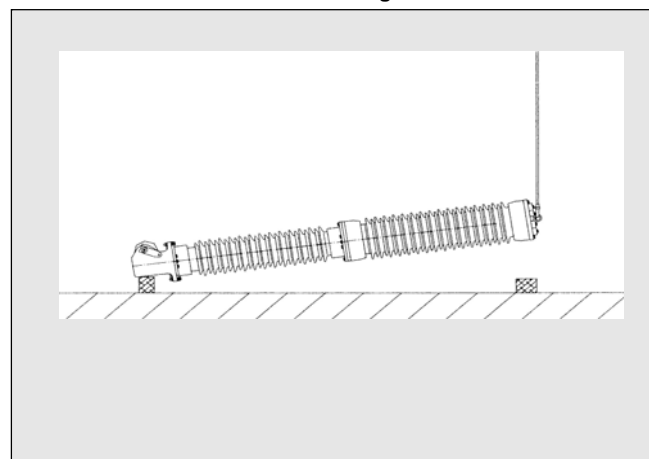


Figure 12. Phrase pole hoisting schematic view

### 3. Pole assembly

#### (1) Inspection before the installment

The range estimate inspects each pole the porcelain insulator whether has the breakage or the crack in the transportation process, if has this kind of situation please promptly with the manufacturer relation. If porcelain or has under the crack condition in the breakage to gasify the operation, has the possibility to be able to have the porcelain body to explode, endangers the personal safety.

Before the pole installment, should first inspect the pole gas tightness. Each pole turns in the arm box to have deflates the valve sufficiently, turns on the valve, if has the divulging sound which the gas sends out, indicated pole gas tightness is good. Each pole when transportation all is at switches on the condition, before the installment draws out the positioning pin, then outside the turn clockwise turns the arm to motionless up to. Outside then chases takes turns the arm. installs when all bolts, the gasket, the pole and the base contact face all should applicate guards 703 against the hydrogel.

Note: Forbid strictly outside the anti-clockwise rotation turning the arm.

#### (2) Pole assembly

First assembles the pole A or the pole B, has double turns the arm the pole is the pole B.

With hoisting mechanisms stands slowly pole A or C. When raises up, must in turn the arm box side upholstery thickness  $\geq 10\text{mm}$  rubber plate or the plank, prevented turns the arm box is well-grounded when has the damage (see figure 12).

Place pole A or pole C in the base corresponding jaw opening, First uses two A8  $\times 50$  tapered cottar localization, then use 4 nuts M16  $\times 60$  to fasten (see figure 15), the bolt passed through the through hole upwardly by under, the nut is tight in the upper extreme, inspect according to shown in figure 15 to install the size. Moreover two installs the method same.

Which corresponds with the pole outside three turns the arm according to the exwork when in outside turns on the arm and the spline shaft marks the number alignment to install (Note: do not mix pole A, C) Then rotates outside each to turn the arm to be able to cause the positioning pin and it fixed, hold the drive mechanism the output pole and B turns the arm will use  $\varnothing 16$  the pin connection (see figure 13).

After completes B to turn the arm and the organization output pole connection, under minute floodgate condition, Turn the arm connected two level operation connecting rod and B (see figure 16), connection  $\varnothing 12$  consumes the silicon fat lubrication (Outside each sells has the brass bush). Pulls out the positioning pin to the transmission sells the position (see figure 17), use bolt M6 and the card sell the transmission the fixed locking. All bolt M6 should spread the anaerobic adhesive before the fastening to prevent becomes less crowded.

Note: When connection operation connecting rod, should in turn between the arm and the connecting rod 5, adjusts the pad, thus guaranteed operates the connecting rod the stress direction and the

heading consistent (see figure 16).

#### 4. The pipeline connection and fill the circuit breaker with SF6 gas

After install pole A, B, C, inspect whether on the chassis the three-phase pipeline has damages, tears down the pipeline and the valve caulking, then scours the valve seal groove and the pipeline correspondence contact face with the ethyl alcohol, inspects the valve circle O, spreads the silicon fat in the seal groove place, again on encircles. and always imitate the chassis and the fixed densimeter deflate the valve panel two M10 bolt to loosen continually, the whole moves towards right approximately 30mm (take faces has the data plate organization box gate as), separately pipeline on nut and valve connection (Tight force 30Nm), After the three-phase connection finished, tight chassis and continually panel two bolt M10 (inspects the densimeter with to regard the opening whether aligns). Connect gasification installment (see figure 18).

Uses in the air bottle the SF6 gas to flush the tube first, about 3-5 sec, then with turns in the arm box valve the pipeline to connect, turns on the valve by phase, gasifies toward the circuit breaker in by phase, prevented because the valve damage creates some sufficiently has not entered the SF6 gas, observe pressure relief valve meter reading value and densimeter value, until pressure is 0.6MPa. After the gasification completes, will gasify in the installment and the base air pump connection twists, and will preserve properly. Always will gasify the valve the protection nut very good.

Note: 1. In the gasification process, the gaseous tube glazed frost is the normal phenomenon, may adjust the pressure relief valve; reduces the speed of flow suitably, prevents the pipeline frostbite.

2. pressure maxi is 0.62MPa.

#### 5. SF6 gas leak detection and micro water survey

Circuit breaker sufficient SF6 gas 0.6Mpa, after 24 hours the leak detection and measures the moisture. The check-out facility user supplies for oneself.

(1) With SF6 gas leak detector inspection circuit breaker all packing surface gas tightness, inspects the gasification pipeline in particular, attaches whether leaks air. If attaches has the air leakage phenomenon, detachable under attaches, whether the observation packing surface does have the foreign matter or the O seal packing collar whether has the damage, after the processing replacement detects leaks. If discovered the pole packing surface has the divulging phenomenon, needs the prompt notice manufacturer to come to solve. The leak detection method may use the pressure drop law, the partial wrap law and the buckle covers the law and so on.

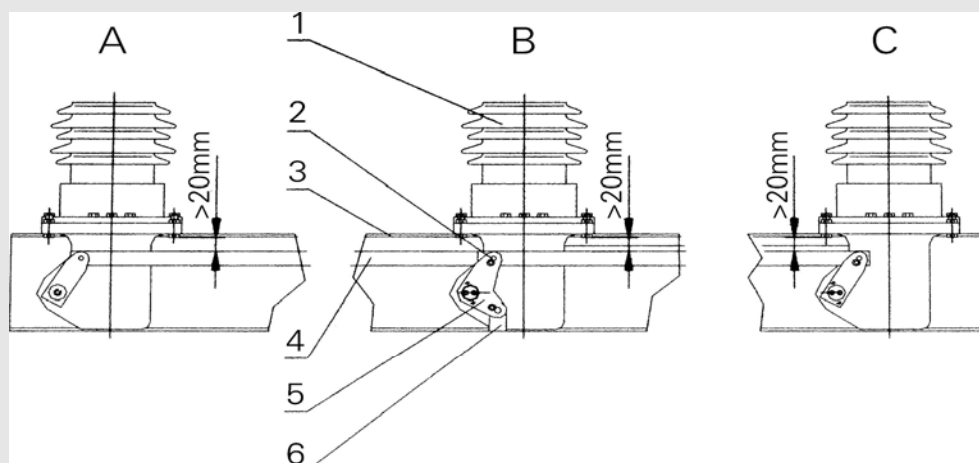
(2) Meets the pressure relief valve, the pipeline and the micro water reflectoscope reflector on the total charge valve, surveys in the circuit breaker air chamber the moisture content, when the approval should not surpass 150ppm (v/v, 20°C), not pass 400ppm (v/v, 20°C). When survey should operate the equipment correctly, reduces the measuring error.



## 6 .Earth connection

All has the earth terminal on two chassis props, the user may according to the actual need earth. Before the earth, polishes the attachment point contact face with the emery cloth.

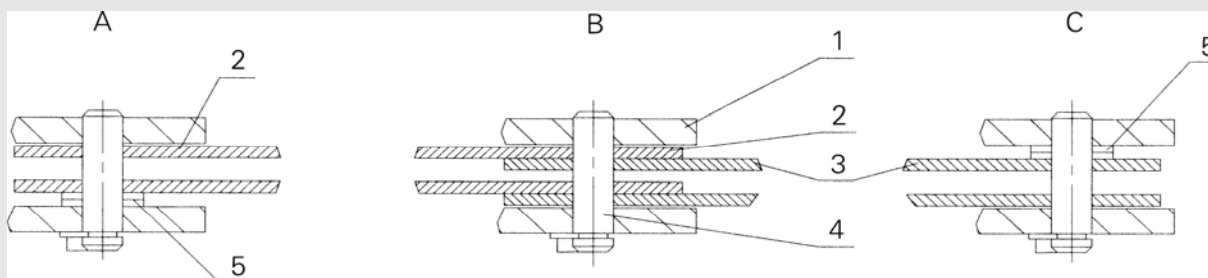
## 7. Install primary terminal



1. Phrase Pole 2. Drive Pin 3. Foundation 4. Operation Rod 5.

B-Phrase Outside Elbow 6. Output Rod

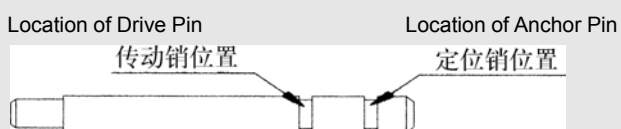
**Figure 15. Phrase pole assembly view**



1. Elbow 2. Operation Rod I 3. Operation Rod II 4.

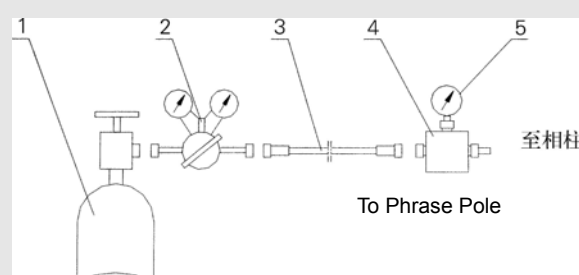
Drive Pin 5. Adjusting Shim

**Figure 16. Fixation of connecting rod**



**Figure 17. Anchor pin**

Under the circuit breaker goes beyond a line in the pro and con all has the going beyond a line (frontage has the minute for the control cubicle on, switches on the instruction at the same time), On the forming block its going beyond a line direction may need to carry on the installment according to the user. If the user has not requested, on the forming block installs in positive one side. When peacefully installs the terminal strip, must tear down the pole crown suspension loop first, keeps the connection upper extreme board 5 spiral holes. install the contact face to polish with the emery cloth, until



1. SF6 Cylinder 2. Relief Valve 3. Pipe 4. General Valve  
5. Density Meter

**figure 18. SF6 Gasification installment connection**

the surface shines, then is clean with the ethyl alcohol clean, evenly spreads lightly in the surface wipes electric conduction paste. Use 5 nuts M16 to fixe. After finish the line the installment, use nuts M16x20 to fixe two spiral hole M16.

#### 8. Installs the circuit breaker two lines

Under the control cubicle the lap has for the user use electric cable sleigh falls the hole, the user may refer to the wiring diagram to connect two lines.

Attention : 1. Two lines must connect under not the charged condition

2. Two lines must in hold drive mechanism the minute, switch on under the condition which the spring all releases to connect.

### VIII. operation and maintenance

#### 1. Tries to operate

Before the operation to be supposed to make following several inspections to the switch:

- a. Guarantees in the switch not installs when under carry-over spare part or tool, and inspects the circuit breaker in the heading whether has the impediment not to demolish, Inspects especially turns in the arm box set bolt and the level operates the connecting rod the vertical range to be bigger than 20mm (see figure 15).
- b. A post cannot and the high tension system is connected
- c. Examines SF6 gas pressure does not have to be lower than 0.3MPa, otherwise can cause the circuit breaker mechanical damage.
- d. Inspects all pin connections whether is fastened
- e. Tries to operate best uses the electrically operated distant place control, before the operation all operator should stand outside 15m or has the shield place.
- f. In any situation, forbid strictlys the circuit breaker single-phase or two operates.

After confirmed the switch may operate, completes the circuit breaker five times to switch on, five floodgate operations, three standard rating cycle operations, the recording switches on with the minute floodgate time, and in throws result filling in transports in the report

#### g. The minute, switches on the velocity measurement

Surveys with the oscilloscope or the switch characteristic reflectoscope reflector, computational method like figure 19 show, the value sees this showing three.

### IX. Circuit breaker maintenance

The SF6 circuit breaker is called the non-maintenance circuit breaker, but carries on a maintenance every three years to the circuit breaker, may guarantee it continues under the good condition to move. The maintenance must carry on in the power failure situation, usually must power cut for several hours. Maintains mainly carries on the following item the inspection and

the maintenance :

1. inspect porcelain surface and cleans
2. Inspect corrosion condition, if has the corrosion to have to make up the paint; If the fastener has the corrosion, must replace.  
Warning: The fastener must replace one by one, because of the pole for the aeroseal pressure vessel, simultaneously replaces can create the person to injure or the equipment damage.
3. Inspect various fasteners whether becomes less crowded, if has must fasten.
4. Inspect a time terminal board whether has the superheat color deterioration phenomenon, if has must polish the contact face and fasten
5. Carries on the lubrication to the organization movement part
6. Survey the micro water content and the record
7. Survey the host return route resistance and the record
8. Inspect two time wiring is whether reliable, whether the electrical instruction can carry out reliably.

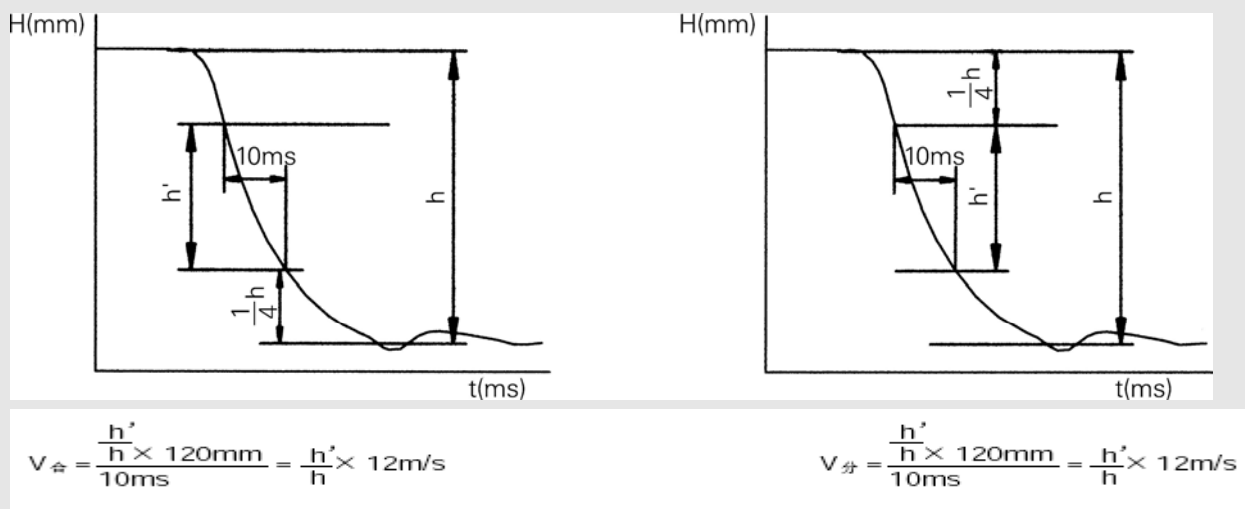
### X. Circuit breaker overhaul

The circuit breaker overhaul mainly refers to the explosion chamber overhaul, must the manufacturer to send the specialist to process. Forbid strictlys the user voluntarily to the circuit breaker disintegration overhaul. The circuit breaker needs the overhaul in the following situation:

- a) Continuous running 20 years
- b) The mechanical operation number of times is bigger than 6000 times
- c) After the circuit breaker achieves its accumulation drop-out current resultant

### XI. Trouble shooting

1. The switch resists to open and close
  - a) The open and close circuit open or wrong wired, inspects the secondary circuit .
  - b) The auxiliary switch is not contacted well; adjust the position of the auxiliary switch
  - c) Opening and closing coil has broken line, replacement the coil.
  - d) SF6 gas block system, inspects the densimeter and the pipeline whether has the leaking point and restores SF6 gas.
2. Electrical machinery not stored energy
  - a) The limit switch moves or the damage, adjusts the limit switch or the replacement.
  - b) Time relay time-lag action, inspection time installation value
3. SF6 pressure drop  
Search divulging point, as valve, pipeline attachment, density relay and packing surface.



**Figure 19. Velocity curve of open and close operations of circuit breakers**

## **XII. Technical document with each CB**

- One Product qualified certificate
- One notice of install instructions
- One Circuit breaker electricity control scheme
- One packing list

## **XIII. Ordering notice**

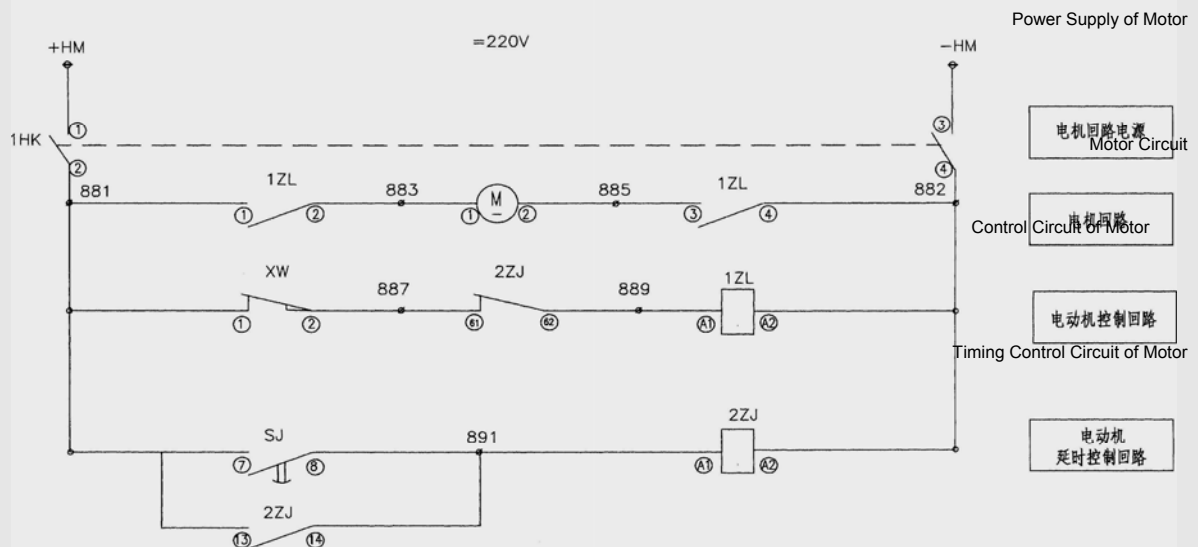
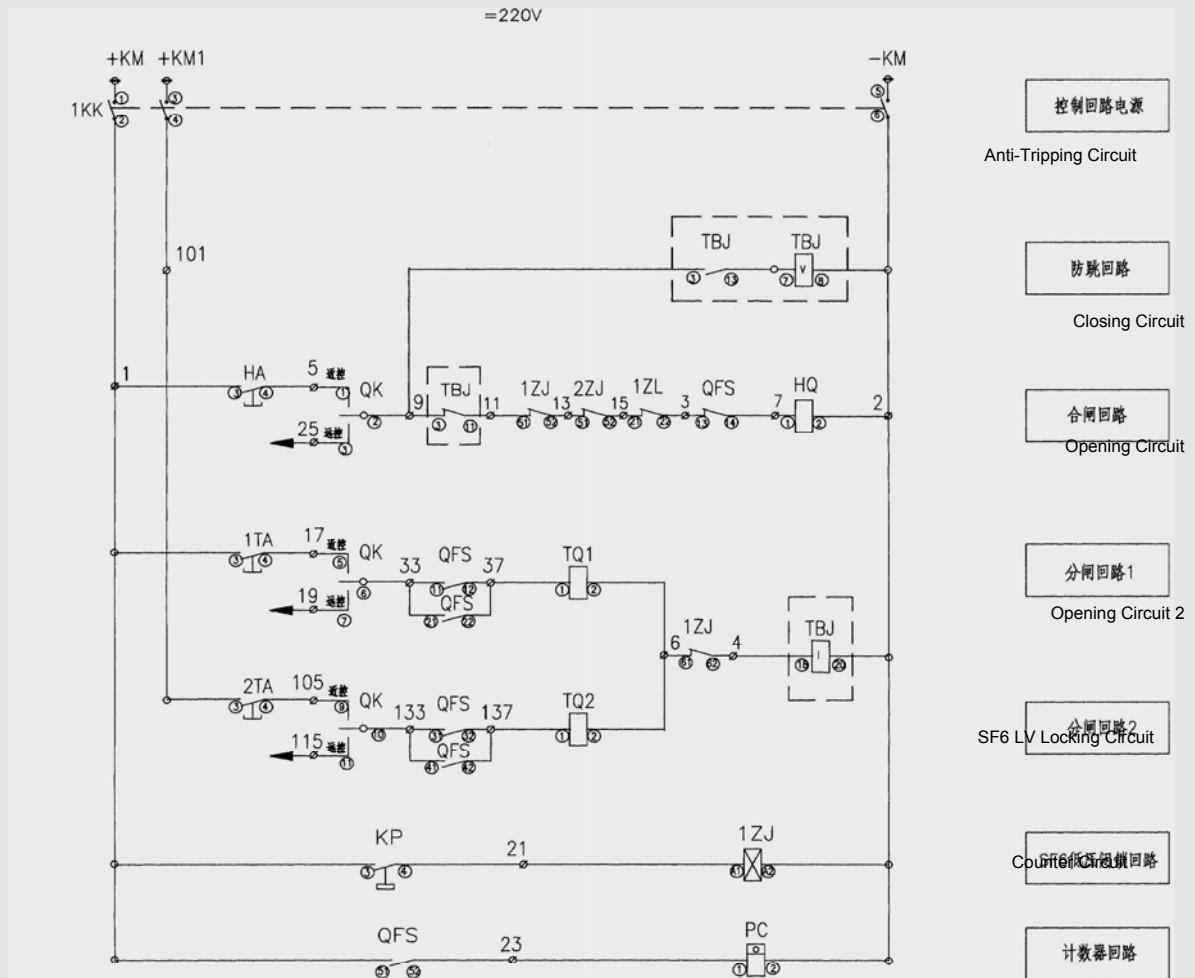
When ordering must indicate following content :

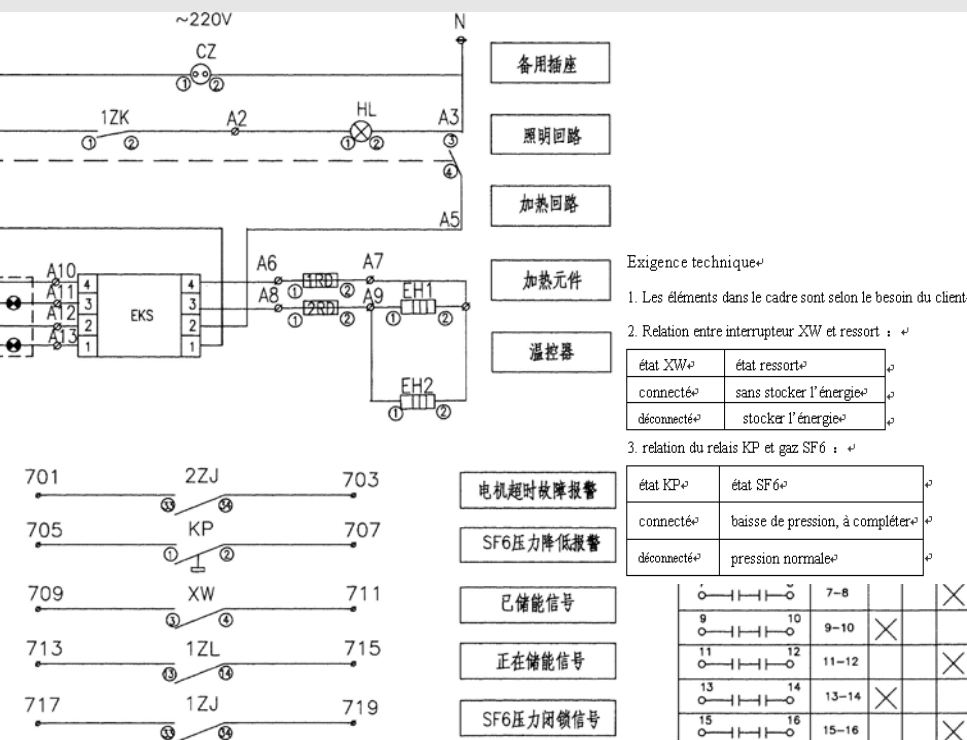
- Circuit breaker model and organization model
- Fixed electrical parameter (voltage, current)
- Use environmental condition
- Operation power source type
- post wiring direction
- Indicate spare parts, fitting, special-purpose tool, special purpose equipment name and quantity

**Notice:** Pay attention to the person the health and safety, the enhancement environmental protection, completes the packing material and reject processing!

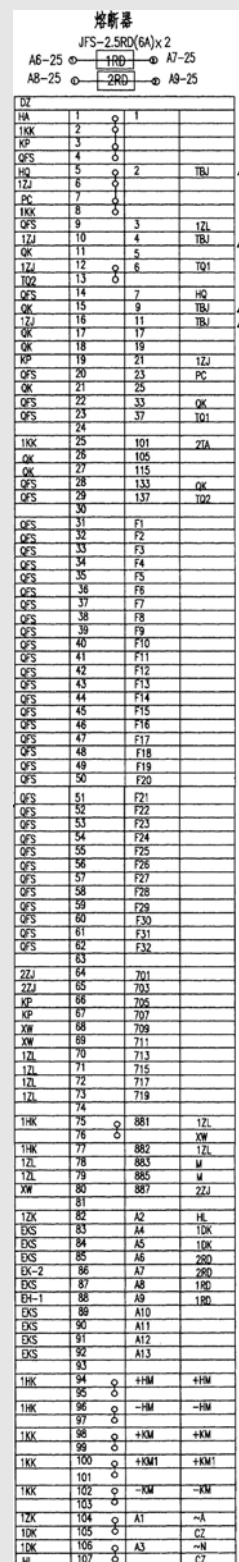


# Power Supply of Control Circuit





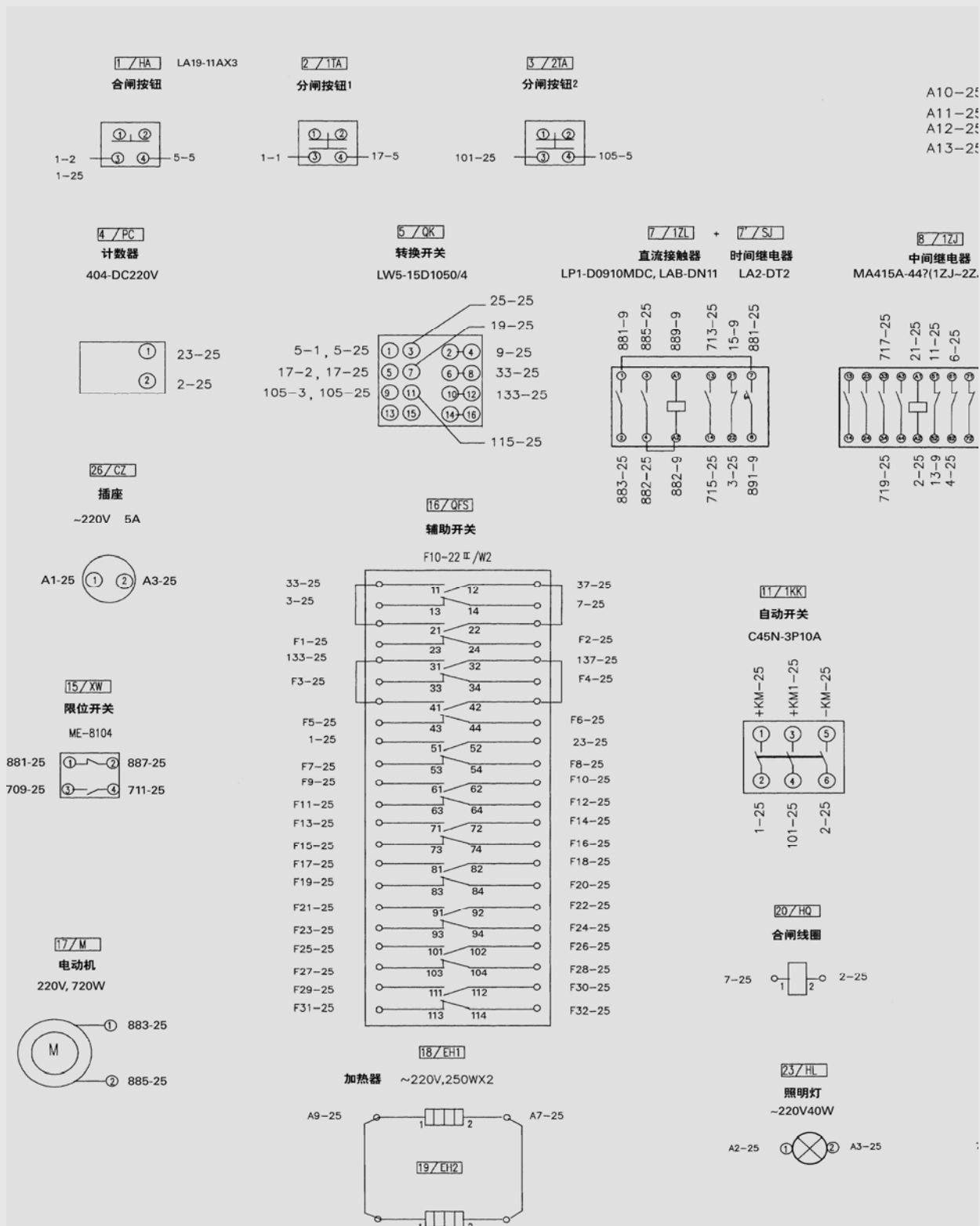
23	CZ	插座	1	~220V, 5A	
22	TBJ	防跳继电器	1	DZB-213, =220V	板后接线 根据用户需要
21	M	电动机	1	HDZ-27205AG, ~220V, 720W	
20	EH1-EH2	加热器	2	~220V, 250W	
19	PC	计数器	1	404型, =220V	
18	KP	密度继电器	1	MKZ-I (-0.1-0.9MPa)	
17	EKS	温度控制器	1	ETS-B(TH)型	
16	TQ1-TQ2	分闸线圈	2	70Ω, =220V, 3A	
15	HQ	合闸线圈	1	110Ω, =220V, 2A	
14	QFS	辅助开关	1	F10-22II/W2	
13	1ZJ-2ZJ	中间继电器	2	3TH8244, =220V	
12	1RD-2RD	熔断器	2	JF5-2.5RD(6A)	
11	SJ	时间继电器	1	LA2-DT2	
10	1ZL	直流接触器	1	LP1-D0910MDC, LA8-DN11	
9	HL	照明灯	1	~220V, 40W 螺座	
8	1ZK	照明开关	1	KN3.1.1	
7	1DK	自动开关	1	C45N-2P10A	
6	1HK	自动开关	1	C45N-2P10A	
5	1KK	自动开关	1	C45N-3P10A	
4	XW	限位开关	1	ME-8104	
3	QK	转换开关	1	LW5-15D1050/4	
2	1TA-2TA	按钮	2	LA19-11A(红色)	
1	HA	按钮	1	LA19-11A(绿色)	



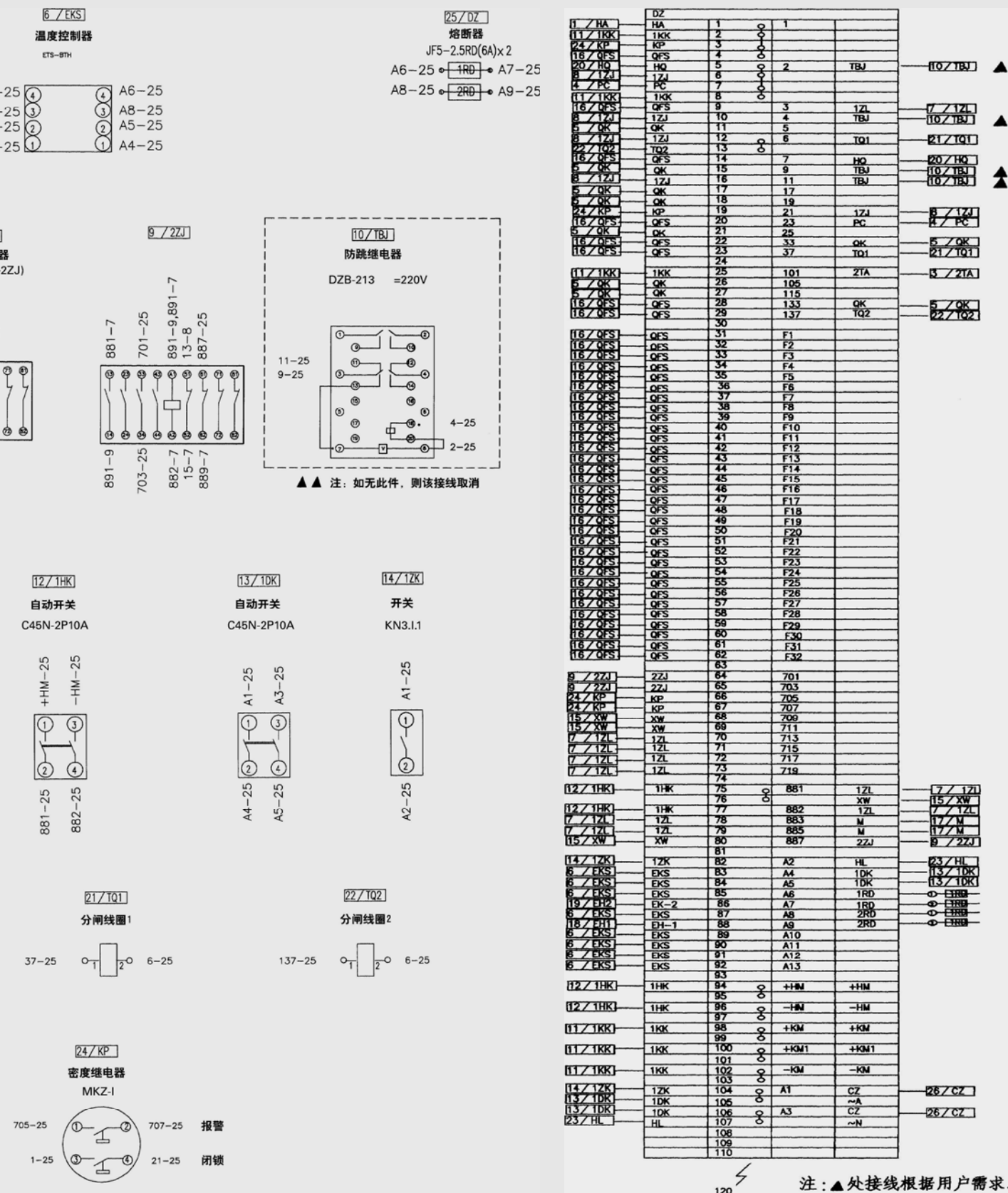
Nota: la liaison du niveau▲est en fonction du client

熔断器 Fuse;备用插座 Spare Socket;照明回路 Lighting Circuit;加热回路 Heating Circuit;加热元件 Heating Unit;温控器 Temperature Controller;  
转换开关 Change-over Switch; LW5-15D1050/4 接点表 LW6-15D1050/4 Contact Table; 电机超时故障报警 Motor OT Alarm, SF6 压力降低报警 SF6 Low Pressure Alarm, 已储能信号 Energy Stored Signal, 正在储能信号 Energy Storing Signal; SF6 压力闭锁信号 SF6 Pressure Locking Signal

**Figure 10a. Control Principle of Circuit Breaker**



合闸按钮 Close Button, 分闸按钮 1 Open Button 1, 分闸按钮 2 Open Button 2, 计数器 Counter, 转换开关 Change-over Switch, 直流接触器 DC Contactor, 电动机 Motor, 合闸线圈 Closing Coil, 加热器 Heater, 照明灯 Lamp 时间继电器 Time Relay, 中间继电器 Intermediate Relay, 插座 Socket, 辅助开关 Auxiliary Switch, 限位开关 Limit Switch, 自动开关 Automatic Switch ,



温度控制器 Temperature Controller, 熔断器 Fuse, 防跳继电器 Anti-Stripping Relay, 注: 如无此件, 则该接线取消 Note: Cancel the wire in case of no this component, 自动开关 Automatic Switch, 开关 Switch, 分闸线圈 1 Open Coil 1, 分闸线圈 2 Open Coil 2, 密度继电器 Density Relay, 报警 Alarm, 闭锁 Locking, 注: ▲处接线根据客户要求 Note: wiring according to the requirements of customers.

**Figure 10b. Control Principle of Circuit Breaker**





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