

# ZW20-12/T1000(630)-25

## 户外高压交流(分界)真空断路器

### Outdoor high pressure AC (demarcation) vacuum circuit breaker



#### 产品说明 Product Description

ZW20A-12/T1000(630)-25型户外高压交流分界真空断路器(以下简称断路器)为额定电压12KV,三相交流50HZ的户外配电设备。它采用真空灭弧和SF6气体作为绝缘介质,是ZW20-12型柱上真空断路器改进型产品。箱体采用了引进日本东芝公司VSP5的气体密封、防爆、绝缘结构技术,进出线导管也进行了密封性能改进,整体密封性能优良,内部充装的SF6气体不泄漏,不受外界环境影响;其弹簧操作机构进行了小型化设计和可靠性和稳定性优化,采用直动链条主传动和多级脱扣系统,动作可靠性和稳定性比国内传统的弹簧操作机构提高了好几倍;主回路的轴与套之间的接触采用了内收外张式表链结构,主回路的接触电阻小、温升低。所以,ZW20-12型户外柱上真空断路器是一种免维护产品,是柱上断路器的佳品。ZW20A-12较ZW20-12还增加了过流保护、机构弹簧储能指示,并配备航空插座作二次电气连接,便于与智能化控制器相结合。

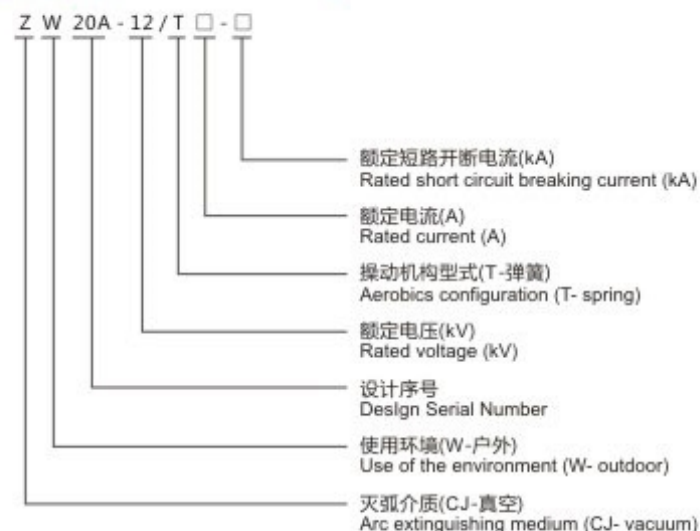
优良的电气和机械性能,使ZW20A-12型户外柱上真空断路器得到广泛的应用。主要用于开断、关合10KV电力系统的负荷电流及短路电流,适用于变电站及工矿企业配电系统中作保护和控制之用,更适用于电网频繁操作的场所。本产品与控制器配套,具有优良的重合器功能,能满足配电自动化系统要求。

本产品主要符合以下标准:

GB1984高压交流断路器

GB/T11022高压开关设备及控制设备标准的共用技术要求

#### 型号及含义 Model and meaning



#### 使用环境 Use of the environment

- 海拔不超过1000m
- 周围空气温度: 上限+40°C, 下限-40°C
- 相对湿度: 日平均值不大于95%, 月平均值不大于90%
- 无经常性的剧烈振动
- No more than 1000m above sea level
- Ambient air temperature: upper limit +40°C, lower limit - 40°C
- Relative humidity: the daily average value is not greater than 95%, and the monthly mean value is not greater than 90%.
- No frequent violent vibration

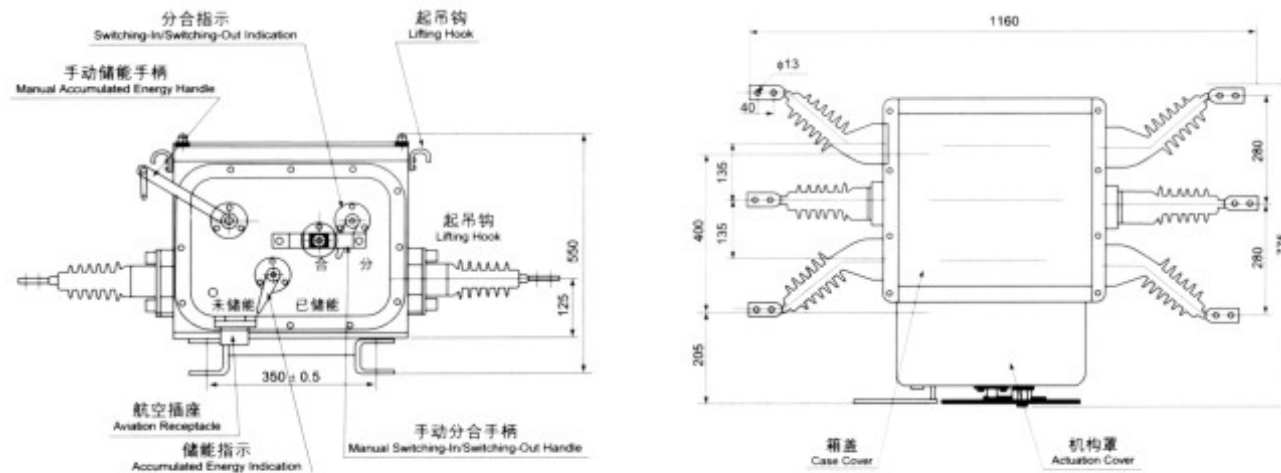
ZW20A-12/T1000 (630) -25 outdoor high-voltage AC demarcation vacuum circuit breaker (hereinafter referred to as circuit breaker) is an outdoor power distribution equipment with rated voltage of 12KV and three-phase AC 50HZ. It uses vacuum arc extinguishing and SF6 gas as insulation medium, and it is an improved product of ZW20-12 type vacuum circuit breaker on column. The box adopts the technology of gas seal, explosion proof and insulation structure introduced by the Japanese Toshiba Co VSP5. The inlet and outlet pipe has also improved the sealing performance, the overall sealing performance is excellent, the internal filling SF6 gas is not leaked and is not affected by the external environment; the spring operating mechanism has made miniaturized design and reliability and stability. The operation reliability and stability are several times higher than that of the traditional spring operating mechanism in China. The contact between the main loop and the sleeve is adopted by the internal external tension chain structure, and the contact resistance of the main loop is small and the Wen Sheng is low. Therefore, the ZW20-12 type outdoor column vacuum circuit breaker is a maintenance free product and a good product of the circuit breaker on the pole. ZW20A-12 has also increased overcurrent protection, mechanism spring energy storage instructions and two electrical connections with an aero socket to facilitate the combination of intelligent controller with ZW20-12.

Excellent electrical and mechanical properties make ZW20A-12 type outdoor column vacuum circuit breaker widely used. It is mainly used to break off and close the load current and short circuit current of 10KV power system. It is suitable for protection and control in power distribution system of substation and industrial and mining enterprises, and is more suitable for frequent operation of power grid. This product is matched with the controller and has excellent recloser function, which can meet the requirements of distribution automation system.

This product is mainly in accordance with the following standards:GB1984 high voltage AC circuit breaker Common technical requirements for GB/T11022 high voltage switchgear and control equipment standards

**主要技术参数 Main technical parameters**

序号	项目	单位	数值
1	额定电压		12
2	额定绝缘水平	1min工频耐压	干式(相间、对地/断口)
			湿式(对地、外绝缘)
		雷电冲击耐受电压(相间、对地/断口)	
3	额定电流	A	630、1000
4	额定频率	Hz	50
5	额定短路开断电流	KA	12.5、16、20、25
6	额定峰值耐受电流(峰值)		31.5、40、50、63
7	额定短时耐受电流		12.5、16、20、25
8	额定短路关合电流(峰值)		31.5、40、50、63
9	额定短时耐受时间	s	4
10	额定操作顺序		分-0.3s-合分-180s-合
11	额定短路开断电流开断次数	次	30
12	机械寿命	次	10000
13	额定操作电压(可按照客户需要定制)	V	220

**外形及安装尺寸 Shape and installation size**


# FZW28-12F

## 户外分界真空负荷开关

### Outdoor demarcation vacuum load switch


**产品说明 Product Description**

FZW28-12F户外分界真空负荷开关(简称分界开关)用于户外柱上安装场合,具有手动合电动操作功能。开关本体采用引进日本东芝公司VSP5-12技术,本开关为免维护负荷开关。采用真空灭弧和SF6气体作对地及相间绝缘介质。本产品符合:GB3804《高压交流负荷开关》及GBT11022《高压开关设备和控制设备标准的共用技术要求》。FZW28-12F户外分界真空负荷开关具备故障检测功能,保护控制功能和通讯功能,安装于10kV架空线路上,可实现自动切除单相接地故障和自动隔离相间短路故障。安装点适用于10kV配电线路用户进线的责任分界点处,也可以适用于符合要求的分支线连接处。

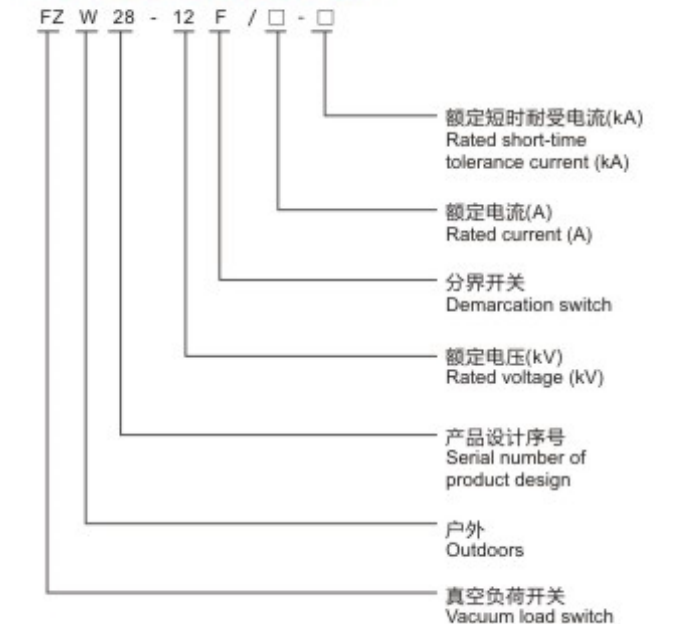
FZW28-12F outdoor demarcation vacuum load switch (referred to as dividing switch) is used on outdoor column installation occasions, with manual and electric operation function. The switch body adopts the Japanese Toshiba Co VSP5-12 technology, and the switch is a maintenance free load switch. The vacuum arc extinguishing and SF6 gas are used to match the ground and the interphase insulation medium. This product conforms to the GB3804 "HV AC load switch" and GBT11022 "common technical requirements for high voltage switchgear and control equipment standards".

FZW28-12F outdoor demarcation vacuum load switch has fault detection function, protection control function and communication function. It can be installed on the 10kV overhead line, which can automatically remove single phase grounding fault and automatically isolate interphase short circuit fault. The installation point can be applied to the duty demarcation point of 10kV distribution line users, and it can also be applied to the branch line connection that meets the requirements.

**使用环境 Use of the environment**

- 周围空气温度上限不超过40°C,下限不超过-45°C;
- 风速不大于35m/s;
- 海拔不高于1000m,地震烈度不超过8度;
- 环境温度:月平均相对湿度不大于90%;日平均相对湿度不大于95%;
- 覆冰厚度不超过10mm;
- 安装场所应为无易燃、易爆、化学腐蚀及经常性剧烈振动的场所;
- 中性点接地方式:中性点不接地、中性点经消弧线圈接地、中性点经小电阻接地;
- 客户如有其它特殊要求,可在订货时提出,我公司给予最大满足。

- The upper limit of ambient air temperature does not exceed 40°C and the lower limit does not exceed -45°C.
- The wind speed is not more than 35m/s;
- The altitude is not higher than 1000m, and the earthquake intensity is not more than 8 degrees.
- Environmental humidity: monthly average relative humidity is not more than 90%; daily average relative humidity is not more than 95%;
- The ice coating thickness is not more than 10mm.
- Installation site should be non-flammable, explosive, chemical corrosion and frequent violent vibration of the site;
- Neutral grounding mode: neutral point is not grounded, neutral point is grounded by arc extinguishing coil, neutral point is grounded by small resistance;
- If the customer has other special requirements, it can be put forward at the time of ordering. Our company will give maximum satisfaction.

**型号及含义 Model and meaning**


**基本功能 Basic function**

- **自动闭锁相间短路故障**  
用户支线发生相间短路故障时，分界开关在变电站断路器或重合器保护跳闸后立即分闸并闭锁，变电站重合后，馈线上的其他分支用户迅速恢复供电。
- **快速定位故障点**  
用户支线事故造成分界开关保护动作后，责任用户停电，由其主动报送事故信息，电力公司派员到现场可通过掌上电脑或通讯模块排查事故原因。
- **自动切除单相接地故障**  
用户支线发生单相接地故障时，分界开关自动分闸；变电站及馈线上的其他分支用户感受不到故障的发生。
- **Automatic interphase interphase short circuit fault**  
When an interphase short circuit fault occurs in a user's branch line, a demarcation switch is relocked and locked immediately after the substation circuit breaker or the recloser is protected and the tripping. After the substation is reconnected, the other branch users on the feeder quickly restore power supply.
- **Fast locating fault point**  
After the user branch accident causes the demarcation switch protection action, the responsible user is blackout, and the accident information is sent on the initiative by the user. The power company dispatches can check the cause of the accident through the palm computer or communication module.
- **Automatic ground fault removal**  
When a single-phase-to-ground fault occurs in a branch line of the user, the dividing switch automatically switches off; the substation and other branches on the feeder can not feel the fault occurring.

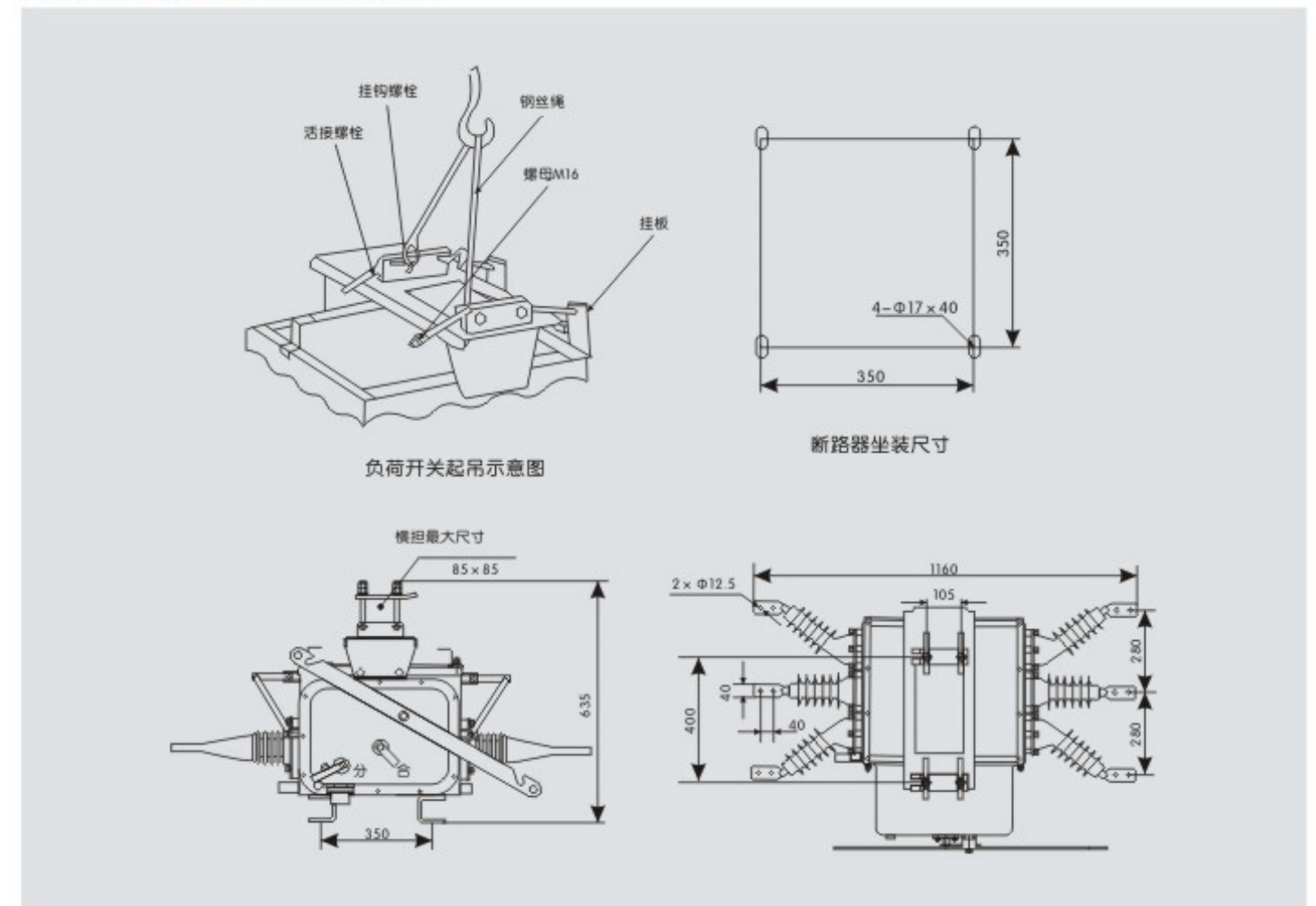
**产品特点 Product features**

- 可检测毫安级的线路零序电流及25倍额定值得相间短路电流，测控准确、动作灵敏；
- 同一规格产品可适用于不同中性点接地运行方式的电力配电系统；
- 真空灭弧，SF6外绝缘，内置隔离刀与灭弧室异步联动，开关分合能力强，安全性好；
- Latch式弹簧操作机构，拉杆式手动合闸，手动或电动脱扣分闸，操作简洁方便；
- 工作电压(电压互感器)可以内置，成套设备整体免维护性高；
- 所有部件全密封，耐候性强，抗凝露性能好；
- 全航空插头电气连接，安装投运快捷、方便、正确、可靠；
- 一般选择无通信方式运行，也可根据需要配置通信模块及灵活选择有线或无线通信方式进行集中数据管理。
- It can detect the zero sequence current of Ma level and 25 times rated, which is worthy of interphase short circuit current.
- The same specification product can be applied to the power distribution system with different neutral grounding modes.
- Vacuum arc extinguishing, SF6 external insulation, built-in isolation knife and arc extinguishing chamber asynchronous linkage, switch separation and combination ability is strong, safety is good.
- Latch spring operation mechanism, pull rod type manual closing, manual or electric tripping, and operation is simple and convenient.
- The working voltage (voltage transformer) can be built, and the whole set of equipment is free of maintenance.
- All components are fully sealed, weatherproof and anti condensing.
- All aviation plugs are electrically connected. Installation and operation are quick, convenient, correct and reliable.
- Generally, no communication mode is selected, and communication module can be configured according to needs and flexible selection of wired or wireless communication. The mode of letter is centralized data management.

**主要技术参数 Main technical parameters**

序号	名称	数据	
1	操作方法	手动或自动(电磁)	
2	额定值	额定电压	12kV
		额定电流	630A
		额定短时耐受电流(4S)	12.5 16 20
		额定关合短路电流(峰值)	31.5 40 50
		额定频率	50Hz
		操作电压	AC220(80%~110%)
3	工频耐压(1min)	对地	42kV
		相间	42kV
		断口	48kV
		二次对地	2kV
4	冲击耐压(峰值)	对地	75kV
		相间	75kV
		断口	84kV
5	净重	185kg	
6	SF6气体额定表压	0表压浓度为93%以上	
7	操作手柄动力的测定	100~400N	
8	主回路电阻	≤500μΩ	

序号	名称	数据	
9	(一) 合闸操作	184~220V	1.合闸时间120~180ms(220V) 400ms以下(184V) 2.弹跳时间不大于10ms 3.吸合电流(峰值)17A以下 4.保持电流不大于0.45A
		最低合闸电压	120~160V
	(二) 分闸操作	184~220V	1.分闸时间1.5s以下 2.不同期时间3ms以下
		最低保持吸合电压	45~85V
10	隔离断口与真空灭弧室分闸时间差	10±2ms	
11	气密试验(检漏)	0.2MPa表压无漏气	
12	真空灭弧室触头开距	7~9mm	
13	真空灭弧室触头超距	3~4mm	
14	隔离断口开距	25~35mm	
15	隔离断口超距	6~13mm	

**外形及安装尺寸 Shape and installation size**


# ZW32-12

## 户外真空断路器

Outdoor vacuum circuit breaker



### 使用环境 Use of the environment

- 环境温度：不高于+40℃，不低于-45℃；
- 空气相对湿度：日平均值不大于95%，月平均值不大于90%；
- 海拔高度不超过2000米；
- 风压不超过700Pa(相当于风速34m/s)；
- 地震烈度不超过8级；
- 无火灾、爆炸、严重污秽、化学腐蚀以及剧烈震动的场所；
- 客户如有其它特殊要求，可在订货时提出，我公司给予最大满足。
- Ambient temperature: not higher than +40℃, not less than -45℃;
- Relative humidity of air: the daily average value is not greater than 95%, and the monthly mean value is not greater than 90%.
- The altitude is not more than 2000 meters.
- The wind pressure is not more than 700Pa (equivalent to wind speed 34m/s);
- The earthquake intensity is not more than 8 levels.
- There are no fire, explosion, serious pollution, chemical corrosion and severe vibration.
- If the customer has other special requirements, it can be put forward at the time of ordering. Our company will give maximum satisfaction.

### 型号及含义 Model and meaning



### 产品说明 Product Description

12kV架空配电线路T接支线路或末端用户内部发生故障时，因其进线开关保护动作时限与变电站出线开关保护时限配合无法合理整定时，将会造成变电站出线开关跳闸。如果故障性质是永久性的，变电站重合将不成功，则一个中压用户界内的局部事故将使整条12kV配电线路停电。如若在T接处或用户端(责任分界点)安装一台户外分界断路器，经过判断确认用户界内发生故障(过流、短路、单相接地等故障)，自动将故障隔离，则可以确保非故障区用户正常用电。ZW32-12F户外高压智能分界真空断路器(看门狗)在12kV馈电架空线路上的应用可避免无故障线路的连带性事故停电、缩小故障停电范围、缩短用户停电时间、保护主网的安全运行。并具备故障检测功能，保护控制功能和通讯功能，可实现自动切除单相接地故障和自动隔离相间短路故障。安装地使用与12kV配电线路用户进线的责任分界点处，也可以适用于符合要求的分支线连接处。

When the 12kV overhead distribution line T connection line or the failure inside the end user, the switch protection action time limit and the substation outgoing switch protection time limit can not be reasonable timing, which will cause the switch off switch of the substation. If the nature of the fault is permanent, the substation overlap will not succeed, then a local accident in a medium voltage user will cause the entire 12kV distribution line to be cut off. If an outdoor dividing circuit breaker is installed at the T junction or the user end (the boundary of responsibility), the fault (overcurrent, short circuit, single phase grounding and other faults) in the user's boundary is confirmed and confirmed, and the fault isolation can be automatically made to ensure the normal power consumption of the user in the non fault zone. The application of the ZW32-12F outdoor high pressure intelligent demarcation vacuum circuit breaker (watchdog) on the 12kV feed overhead line can avoid the blackout of the connection accidents of the fault line, reduce the fault outage range, shorten the power outage time of the users, and protect the safe operation of the main network. It also has fault detection function, protection control function and communication function. It can automatically remove single phase earth fault and automatic isolation interphase short circuit fault. The installation site can also be used to meet the required branch line connections at the point of departure from the responsibility of 12kV distribution line users.

### 产品特点 Product features

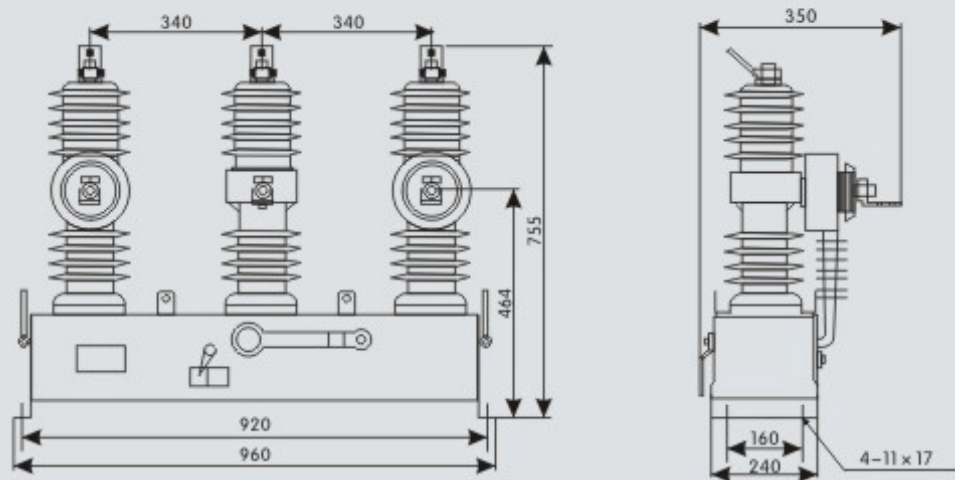
- 装有真空灭弧室的柱上真空断路器开断性能稳定可靠，具有无燃烧和爆炸危险、安全、免维护、体积小、重量轻和使用寿命长等特点；
- 断路器采用全封闭结构，密封性能好，有助于提高防潮、防凝露性能；
- 断路器可装设二相或三相CT，输出二相或三相电流供三段式保护或智能控制器进行信息分析；
- 断路器的合、分闸可手动或电动操作，亦可遥控操作。
- 操作机构密封在开关箱体内部，可以有效避免开关因长期处于户外环境下而引起机构锈蚀。
- 操作机构新颖、简单、动作可靠、体积小、机械寿命可达1万次。
- The on-off vacuum circuit breaker equipped with vacuum interrupter is stable and reliable, with no danger of combustion and explosion. Safety, maintenance free, small size, light weight and long service life.
- The circuit breaker adopts a fully enclosed structure with good sealing performance, which helps to improve moisture-proof and anti condensation performance.
- The circuit breaker can be equipped with two phase or three phase CT, and output two phase or three phase current for three stage protection or intelligent controller. Carry on the information analysis;
- The circuit breaker can be operated manually or electrically, and can also be operated remotely.
- The operating mechanism is sealed inside the switch box, which can effectively prevent the switch from being exposed to outdoor environment for a long time. The mechanism is rusty.
- The operating mechanism is novel, simple, reliable in action, small in size and 10 thousand times in mechanical life.

### 主要技术参数 Main technical parameters

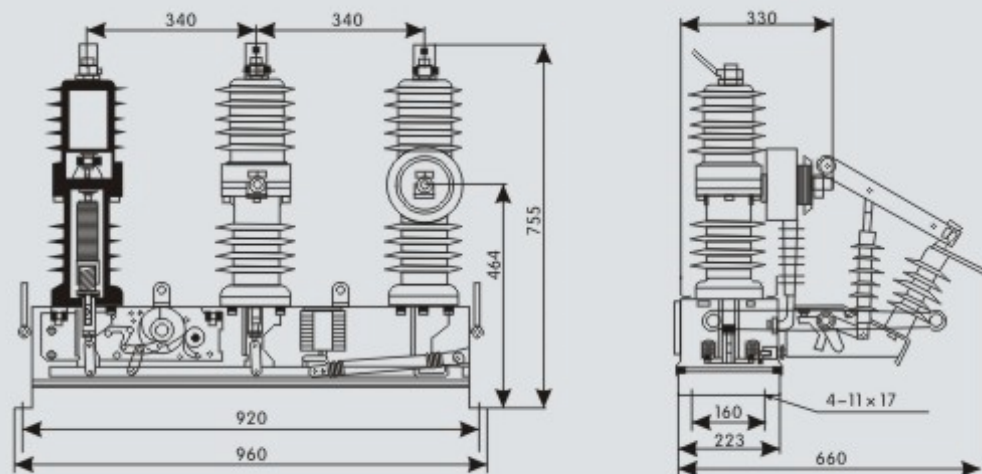
序号	参数名称	单位	数值	
1	额定电压	kV	12	
2	额定电流	A	630、1250	
3	额定频率	Hz	50	
4	工频耐压 (1min)	干式(相间、对地/断口)	42/48	
		湿试(对地、外绝缘)	34	
5	雷电冲击耐受电流(峰值)(相间、对地/断口)	kV	75/85	
6	额定短路开断电流	kA	20	25
7	额定短路关合电流(峰值)	kA	50	63
8	额定峰值耐受电流	kA	50	63
9	4S短时耐受电流	kA	20	25
10	额定操作循环		分-0.3s-合分-180s-合分	
11	额定短路电流开断次数	次	30	
12	机械寿命	次	10000	
13	二次回路1min工频耐压	kV	2	

### 主要机械参数 Main mechanical parameters

序号	参数名称	单位	数值
1	触头开距	mm	9±1
2	触头超行程	mm	2.5±1
3	分闸速度	m/s	1.1±0.3
4	合闸速度	m/s	0.6±0.2
5	触头合闸弹跳时间	ms	≤2
6	相间中心距离	mm	340±2
7	三相分合闸不同期性	ms	≤2
8	各相导电回路电阻	μΩ	<80(带隔离刀200)
9	重量	kg	约70

**外形及安装尺寸 Shape and installation size**


ZW32-12F不带隔离外形及安装尺寸图



ZW32-12FG带隔离外形及安装尺寸图

# ZW32-12M

## 户外高压永磁真空断路器

Outdoor high pressure permanent magnet vacuum circuit breaker


**产品说明 Product Description**

随着电网建设的迅速发展,对安全供电可靠性要求越来越高,以及电力系统中配网运行要求的提高和馈线自动化(FA)建设的需要,功能单一的一次设备在配网网络的应用中日益显示出其不便之处。因而从配网系统的发展着眼,开发一系列利用现代电子技术、通信技术、计算机技术、传感器技术和网络技术,将配网实时信息、离线信息、用户信息、电网结构参数进行集成,具备故障检测功能、保护控制功能、自动测量功能、现代通讯功能及事件记录功能,可实现自动分断故障电流、快速隔离配网故障的节点(FTU/TTU)的智能一体化开关已势在必行。基于这一思想,本公司研制开发了ZW32-12M户外高压永磁真空断路器,广泛适用于城市电网作为分段或联络开关,或用于农网配电系统户外变电站作为出线开关,可有效分、合负荷电流和短路电流。装置内部所配置的测量保护控制和通讯功能可充分满足配网自动化系统要求。由于ZW32-12M户外高压永磁真空断路器应用了多项专利技术,使它有很多优点:无SF6、无油、受环境影响小、有利于环境保护;单元尺寸小、重量轻、便于柱上安装;智能控制单元紧凑适用可以简单地安装在柱子的下方,可以再100米范围内控制开关的分合;适用于城乡电网就地操作和远方控制,出了电池和电容每6至7年更换一次外,断路器本体终身免维护。

With the rapid development of power grid construction, the demand for safe power supply reliability is getting higher and higher. In the system, the requirements for distribution network operation and the need for FA construction are single. The application of secondary equipment in distribution network is increasingly showing its inconveniences. Thus from the distribution network system we should focus on the development of modern electronic technology and communication technology. Computer technology, sensor technology and network technology will distribute real-time information, off-line information, user information and power distribution network. The integration of network structure parameters has the function of fault detection, protection and control, and automatic measuring work. Energy, modern communication function and event recording function can realize automatic breaking of fault current and quick separation. The intelligent integrated switch (FTU/TTU) is imperative. Based on this our company has developed ZW32-12M outdoor high voltage permanent magnet vacuum circuit breaker. It is used as subsection or connection switch for urban power network, or for outdoor substation of rural power distribution system. For the outlet switch, it can effectively split, load current and short-circuit current. Measuring the internal configuration of the device. Quantity protection control and communication functions can fully meet the requirements of distribution automation system. Because of ZW32-The 12M outdoor high voltage permanent magnet vacuum circuit breaker has many advantages due to its patented technology. No SF6, no oil, little environmental impact, conducive to environmental protection; small unit size, light weight, easy to install on the column; intelligent control unit is compact and suitable for simple installation under the column. The switch can be controlled within 100 meters, and it is suitable for local operation and remote control of urban and rural power grids. The battery and capacitor are replaced once every 6 to 7 years, and the circuit breaker body is free from maintenance for life.

**使用环境 Use of the environment**

- 环境温度: 不高于+40°C, 不低于-45°C;
- 空气相对湿度: 日平均值不大于95%, 月平均值不大于90%;
- 海拔高度不超过2000米;
- 风压不超过700Pa(相当于风速34m/s);
- 地震烈度不超过8级;
- 无火灾、爆炸、严重污秽、化学腐蚀以及剧烈震动的场所;
- 客户如有其它特殊要求, 可在订货时提出, 我公司给予最大满足。
- Ambient temperature: not higher than +40°C, not less than -45°C;
- Relative humidity of air: the daily average value is not greater than 95%, and the monthly mean value is not greater than 90%.
- The altitude is not more than 2000 meters.
- The wind pressure is not more than 700Pa (equivalent to wind speed 34m/s);
- The earthquake intensity is not more than 8 levels.
- There are no fire, explosion, serious pollution, chemical corrosion and severe vibration.
- If the customer has other special requirements, it can be put forward at the time of ordering. Our company will give maximum satisfaction.

**型号及含义 Model and meaning**

Z W 32 - 12 M G / □ - □

- 额定短时耐受电流(kA) Rated short-time tolerance current (kA)
- 额定电流(A) Rated current (A)
- 带隔离开关 Isolation switch
- 永磁 Permanent magnet
- 额定电压(kV) Rated voltage (kV)
- 产品设计序号 Serial number of product design
- 户外 Outdoors
- 真空断路器 Vacuum circuit breaker

**产品特点 Product features**

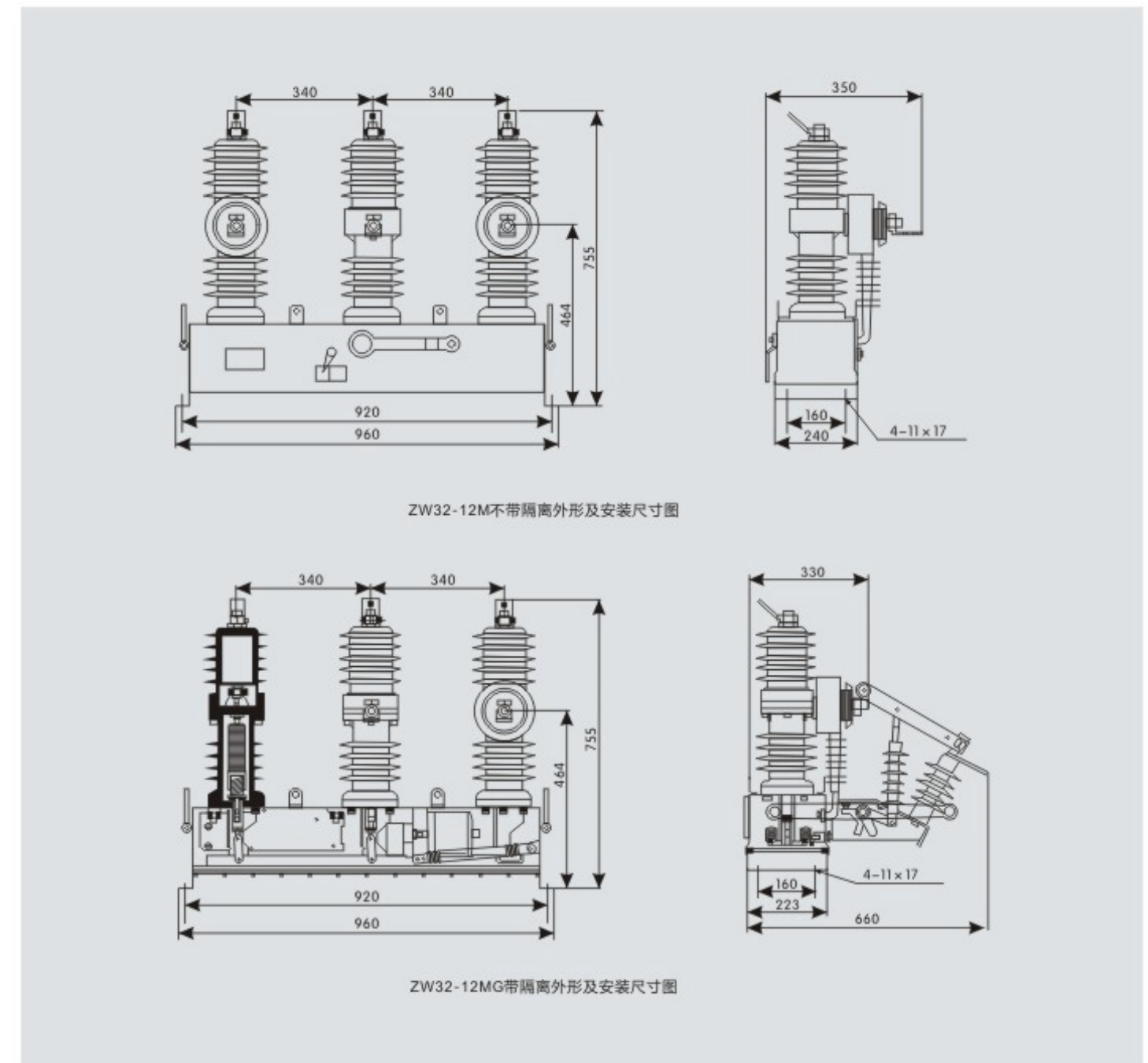
- 装有真空灭弧室的柱上真空断路器开断性能稳定可靠，具有无燃烧和爆炸危险、安全、免维护、体积小、重量轻和使用寿命长等特点；
  - 断路器采用永磁操动机构，具有结构简单、零件少，运动部件只有一个，与传统弹簧机构近百个零件相比，大大地减少了故障源，极大的提高了可靠性。同时取消了容易引发故障的机械脱、锁扣装置，使整个系统的操作可靠性大大得到了提高；
  - 永磁机构控制器独有的自适应及自检功能，可对永磁机构的运动特性进行优化，使真空断路器的机械特性达到最佳，从而延长了永磁机构和真空灭弧室的寿命；
  - 由于产品采用永磁机构操动，具有动作可靠及快速的独特优点，其固有动作时间不会超过10ms及动作时间一致，非常方便于各级断路器保护参数的设置及动作；
  - 产品的永磁操动机构具有电动分闸和带负荷手动合(具有国家专利)及紧急分闸四种功能。装设有三相保护CT、零序CT、AB相间电压，通过控制器的实时监测上传的输入量，并与定值进行比较来判断断路器故障的类型，从而进行相应处理。
  - 操作机构密封在开关箱体内部，可以有效避免开关因长期处于户外环境下而引起机构锈蚀。
  - 操作机构新颖、简单、动作可靠、体积小、机械寿命可达3万次。
- The vacuum circuit breaker equipped with vacuum interrupter is stable and reliable, and has the characteristics of no combustion and explosion danger, safety, maintenance free, small volume, light weight and long service life.
  - The circuit breaker adopts permanent magnetic actuator, which has simple structure, few parts and only one moving part. Compared with nearly 100 parts of the traditional spring mechanism, it greatly reduces the fault source and greatly improves the reliability. At the same time, the mechanical removal and locking device which is easy to cause failure is cancelled, so that the operation reliability of the whole system has been greatly improved.
  - The self-adaptive and self inspection functions of permanent magnetic mechanism controller can optimize the motion characteristics of permanent magnet mechanism, make the mechanical characteristics of the vacuum circuit breaker best, and prolong the life of permanent magnetic mechanism and vacuum interrupter.
  - As the product is operated by permanent magnetic mechanism, it has the unique advantages of reliable and rapid action, and its inherent action time will not exceed 10ms and the action time, so it is very convenient to set and move the protection parameters of the circuit breakers at all levels.
  - The permanent magnetic actuator of the product has four functions, namely, electric switching and manual operation with load (national patent) and emergency trip. Equipped with three phase protection CT, zero sequence CT, AB interphase voltage, real-time monitoring of uploaded transmission through the controller. The input quantity is compared with the fixed value to determine the type of circuit breaker fault, so as to deal with it accordingly.
  - The operating mechanism is sealed inside the switch box, which can effectively avoid the corrosion of the switch due to long-term outdoor environment.
  - The operating mechanism is novel, simple, reliable in action, small in size and 30 thousand times in mechanical life.

**主要技术参数 Main technical parameters**

序号	参数名称	单位	数值	
1	额定电压	kV	12	
2	额定电流	A	630、1250	
3	额定频率	Hz	50	
4	工频耐压 (1min)	kV	干式(相间、对地/断口)	42/48
			湿试(对地、外绝缘)	34
5	雷电冲击耐受电流(峰值)(相间、对地/断口)	kV	75/85	
6	额定短路开断电流	kA	20	25
7	额定短路关合电流(峰值)	kA	50	63
8	额定峰值耐受电流	kA	50	63
9	4S短时耐受电流	kA	20	25
10	额定操作循环		分-0.3s-合分-180s-合分	
11	额定短路电流开断次数	次	30	
12	机械寿命	次	30000	
13	二次回路1min工频耐压	kV	2	

**主要机械参数 Main mechanical parameters**

序号	参数名称	单位	数值	序号	参数名称	单位	数值
1	触头开距	mm	9±1	6	相间中心距离	mm	340±2
2	触头超行程	mm	2.5±1	7	三相分闸不同期性	ms	≤2
3	分闸速度	m/s	1.1±0.3	8	各相导电回路电阻	μΩ	<80(带隔离刀200)
4	合闸速度	m/s	0.6±0.2	9	重量	kg	约70
5	触头合闸弹跳时间	ms	≤2				

**外形及安装尺寸 Shape and installation size**


ZW32-12M不带隔离外形及安装尺寸图

ZW32-12MG带隔离外形及安装尺寸图

# ZW32-24

## 户外高压真空断路器

Outdoor high pressure vacuum circuit breaker



### 使用环境 Use of the environment

- 海拔高度1000m;
- 周围空气温度-45°C~+65°C; 日温差25°C;
- 风速不大于35m/s;
- 地震强度不超过8度;
- 污秽等级: IV级;
- 安装场所: 无易燃、爆炸危险、化学腐蚀的场所。
- Altitude 1000m;
- Ambient air temperature is -45°C ~+65°C, and daily temperature difference is 25 °C;
- The wind speed is not more than 35m/s;
- The intensity of the earthquake is not more than 8 degrees.
- Pollution grade: IV grade;
- Installation place: there is no inflammable, explosive danger, chemical corrosion place.

### 型号及含义 Model and meaning

ZW 32 - 24 G / T □ 1250 - 20(25/31.5)



### 产品说明 Product Description

ZW32-24型户外交流高压真空断路器(以下简称断路器)是额定电压为24kV, 50Hz三相交流的户外配电设备。

主要用于配电网开断、关合电力系统中的负荷电流、过载电流及短路电流。适用于变电站及工矿企业配电系统中作保护和控制之用, 更适用于农村电网及频繁操作的场所。

本安装使用说明书规定了断路器的主要技术参数、产品结构、以及操作、安装、使用维护的原理和方法等内容。

Type ZW32-24 outdoor AC high voltage vacuum circuit breaker (hereinafter referred to as circuit breaker) is rated voltage of 24kV, 50Hz three-phase AC outdoor distribution equipment.

It is mainly used for breaking and closing load current, overload current and short circuit in power system. Electric current. It is suitable for protection and control in distribution system of substations and industrial and mining enterprises, and is more applicable. It is in the rural power grid and frequently operated places.

This installation manual specifies the main technical parameters, product structure and operation of the circuit breaker. The principles and methods of making, installing, using and maintaining.

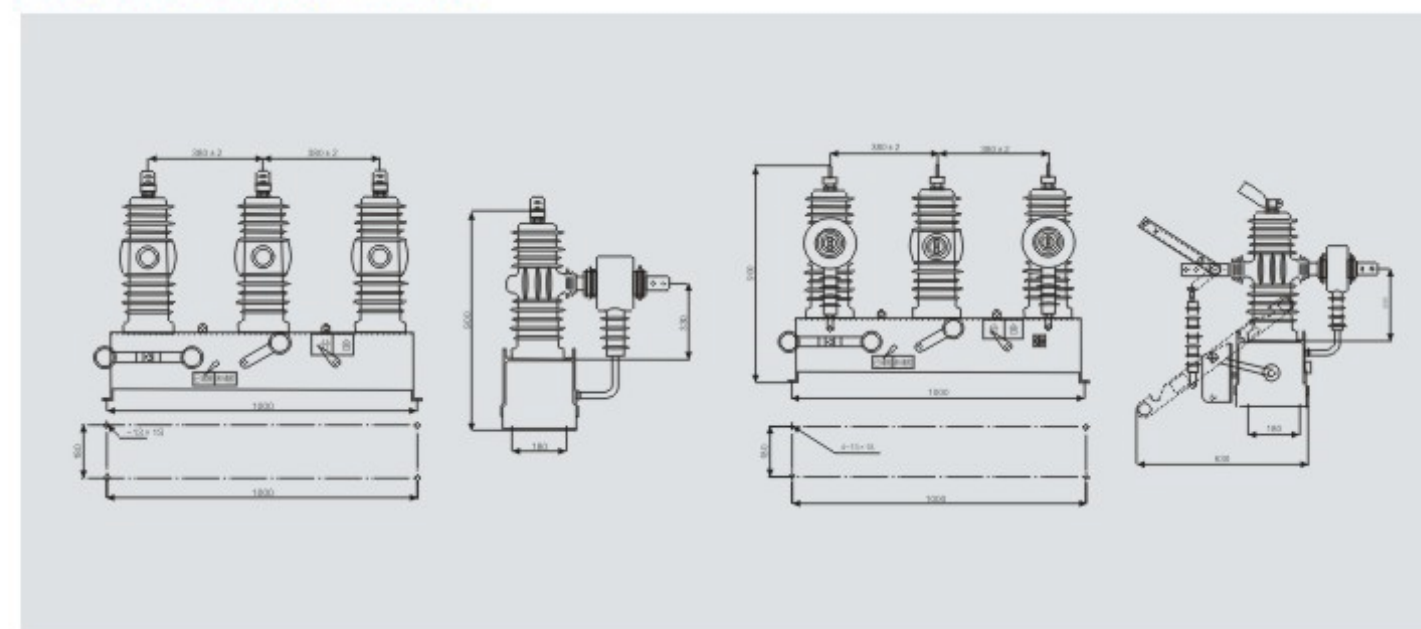
### 主要特点 Main features

- 断路器采用三相支柱式结构, 具有开断性能稳定可靠、无燃烧和爆炸危险、免维护、体积小、重量轻和使用寿命长等特点。
- 断路器采用全封闭结构, 密封性能好, 有助于提高防潮、防凝露性能, 特别适应于严寒或潮湿地区使用。
- 三相支柱采用SMC硅橡胶压制, 具有耐高低温、紫外线、耐老化的特点。
- 操作机构采用小型化弹簧操作机构, 分合闸能耗低; 机构传动采用直动传动方式, 分合闸部件少, 可靠性高。
- 操作机构置于密封的机构箱中, 解决了机构锈蚀的问题, 提高了机构的可靠性。
- 断路器的分、合闸操作可采用手动或电动操作及远方操作。可与控制器配套实现配电自动化, 也可以与重合器控制器配合组成重合器。
- 断路器可以装设二相或三相CT, 供过电流自动脱扣保护和智能控制进行信息分析。
- 断路器可装隔离开关、三相联动, 在隔离开关分闸状态下有明显的可见断口, 并具备与断路器本体之间的防误联锁, 可连装避雷器支柱绝缘子维护方便安全。
- 断路器重量: 138kg
- 整体外形尺寸: 1080×930×900(长×宽×高)
- 安装尺寸: 1000×180

### 主要技术参数 Main technical parameters

序号	项目	单位	数值	
1	额定电压	kV	24	
2	额定频率	Hz	50	
3	额定电流	A	630/1250/1600	
4	额定短路开断电流	kA	20/25/31.5	
5	额定峰值耐受电流(峰值)	kA	50/63/80	
6	额定短时耐受电流/持续时间	kA/s	25/4	
7	额定短路关合电流(峰值)	kA	50/63/80	
8	额定操作顺序		0-0.3s-CO-180c-CO	
9	机械寿命	次	10000	
10	额定电流开断次数	次	10000	
11	额定短路开断电流开断次数	次	20	
12	1min工频耐压	(湿)相间、对地/断口	kV	50/60
		(干)相间、对地/断口		60/65
13	雷电冲击耐受电压(峰值)	相间、对地/断口	kV	95/125
14	二次回路 1 min工频耐压	V	2000	
15	重量	kg	138	

### 外形及安装尺寸 Shape and installation size



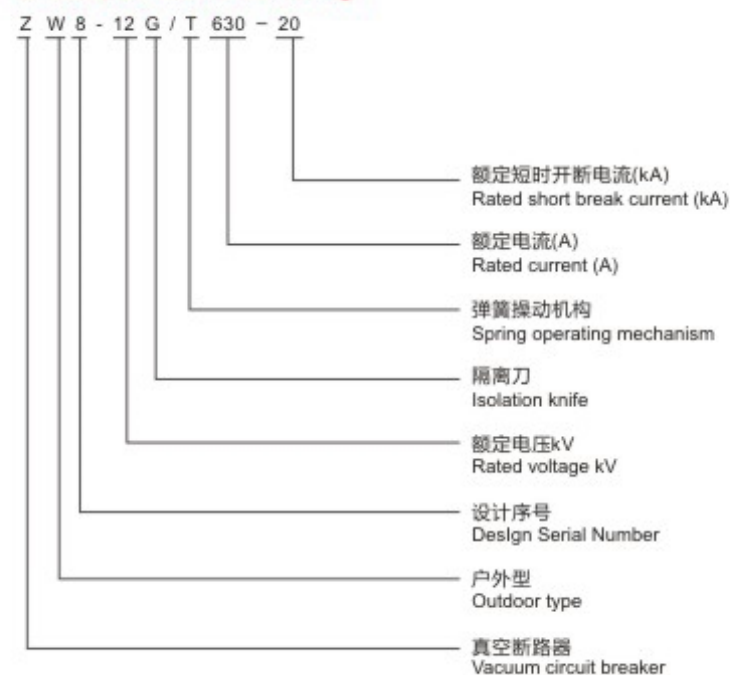
# ZW8-12

## 户外高压真空断路器

Outdoor high pressure vacuum circuit breaker



### 型号及含义 Model and meaning



### 产品说明 Product Description

本产品的操动机构为CT23型弹簧机构，分电动和手动。它具有过载及短路保护功能、速断保护功能、定时限延时保护功能、自动重合闸功能，还可以根据用户需要配装避雷器或隔离开关(即断路器与隔离开关组合，以下简称“组合智能型断路器”)等。该智能型断路器自备电源，可就近遥控操作，备有CT、PT接口，可满足遥测要求。

The operating mechanism of this product is CT23 spring mechanism, which is divided into electric and manual. It has the function of overload and short circuit protection, quick break protection function, time delay protection function, automatic reclosing function, and can also install the lightning arrester or isolation switch according to the needs of the user (i. e. the combination of circuit breaker and isolation switch, hereinafter referred to as "combined intelligent circuit breaker") and so on. The intelligent circuit breaker self provided power supply can be operated remotely, equipped with CT and PT interface to meet the telemetry requirements.

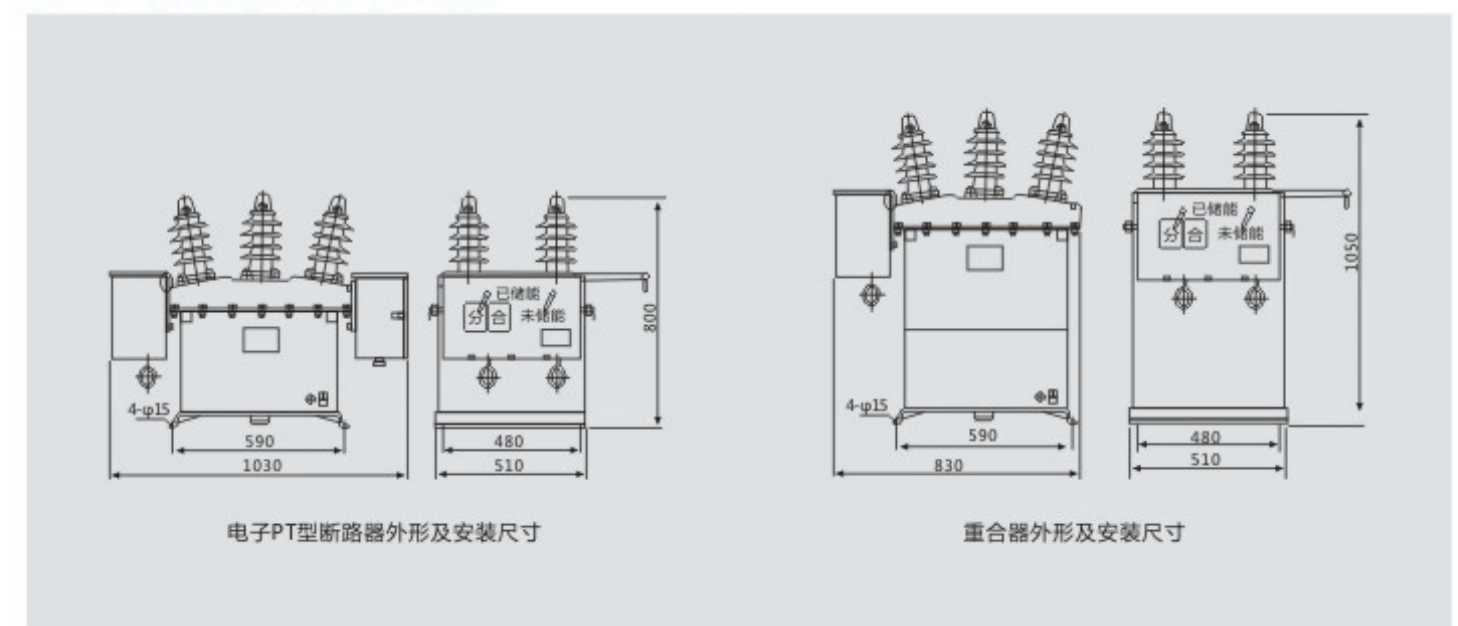
### 使用环境 Use of the environment

- 周围温度：-30℃~+40℃；
- 海拔高度：≤1000m(若须增高海拔，则额定绝缘水平相应提高)；
- 风压：不超过700Pa(相当于风速34m/s)；
- 振幅：地震烈度不超过8级；
- 污秽等级：Ⅲ级；
- 最大日温差：不超过25℃。
- Ambient temperature: -30℃ ~ +40℃;
- Altitude: less than 1000m (if the altitude is increased, the rated insulation level will be raised correspondingly).
- Wind pressure: no more than 700Pa (equivalent to wind speed 34m/s);
- Amplitude: the earthquake intensity is not more than 8.
- Pollution grade: Grade III;
- Maximum daily temperature difference: no more than 25 °C.

### 主要技术参数 Main technical parameters

序号	项目	单位	数值		
1	额定电压	kV	12		
2	额定绝缘水平	min工频耐压	干式	kV	42
			湿式(对地)	kV	34
		雷电冲击耐受电压(峰值)	kV	75	
3	额定电流	A	630、400、20		
4	额定短路开断电流	kA	20、16、12.5		
5	额定操作顺序		分-0.3s-合 分-180s-合分		
6	额定短路开断电流开断次数	次	30		
7	额定短路关合电流(峰值)	A	50		
8	额定峰值耐受电流	A	50		
9	额定短时耐受电流	A	20		
10	额定短路开断持续时间	s	4		
11	机械寿命	次	10000		
12	遥控距离	m	30		
13	重合次数	次	1-3		
14	普通型尺寸	mm	830×560×800		
15	带隔离尺寸	mm	950×960×800		

### 外形及安装尺寸 Shape and installation size





# ZW7-40.5

## 户外高压真空断路器

Outdoor high pressure vacuum circuit breaker



### 产品说明 Product Description

ZW7系列40.5kV户外真空断路器,是我公司开发的具有国际九十年代初水平的户外产品。它既可用于发电厂,变电站,电力设备和电力线路的控制和保护,也可用于频繁操作的场所,它不但用于新变电所的建设,而且也适用于老变电所的油化改造。

ZW7 series 40.5kV outdoor vacuum circuit breaker is an outdoor product developed by our company at the beginning of 90s. It can be used not only for the control and protection of power plants, substations, electric power equipment and power lines, but also for frequent operation. It is not only used in the construction of new substations, but also for the non oil transformation of the old substation.

### 主要技术参数 Main technical parameters

序号	项目	单位	数值
1	触头开距	mm	22±2
2	触头超行程		4±1
3	平均分闸速度	M/s	≤2
4	平均分闸速度		≤1
5	触头合闸弹跳时间	ms	≤5
6	三相分闸同期性时差		≤2
7	合闸时间	ms	≤150
8	分闸时间		≤60
9	每相回路直流电阻(不含电流互感器)	μΩ	≤100

### 使用环境 Use of the environment

ZW7系列40.5kV户外真空断路器用于交流50Hz的三相电力系统,作为分、合负荷电流,过载电流及短路电流之用。

产品根据使用条件可分为普通型、防污型及高原型

符合标准:GB1984《交流高压断路器》和IEC56《交流高压断路器》的标准,及ONJ.520.023JT(户外高压真空断路器技术条件)。

普通型产品条件:

- 周围空气温度:上限+40°C,下限一般地区-30°C,高寒地区-40°C;
- 海拔:2000m(高压型3000m);
- 风压不超过700Pa(相当于风速34m/S);
- 地震烈度,不超过8度;
- 空气污染程度III级。

ZW7 series 40.5kV type outdoor vacuum circuit breakers are used for three-phase 50Hz power system. Load current, overload current and short circuit current.

Products can be classified into general, antifouling and highland based on their use conditions.

Meet the standards: GB1984 "AC high voltage circuit breaker" and IEC56 "AC high voltage circuit breaker" standards, and ONJ.520.023JT (outdoor high voltage vacuum circuit breaker technical conditions).

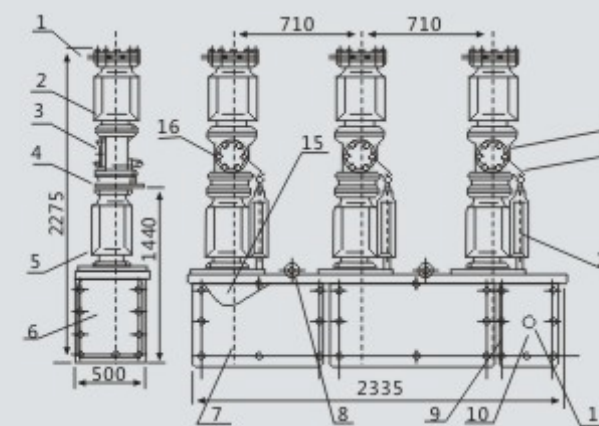
General product conditions:

- Ambient air temperature: the upper limit is +40°C, the lower limit is -30°C-40°C, and the alpine area is about°C.
- Altitude: 2000m (high pressure type 3000m);
- The wind pressure is not more than 700Pa (equivalent to wind speed 34m/S);
- The earthquake intensity is not more than 8 degrees.
- Air pollution level is III grade.

### 主要技术参数 Main technical parameters

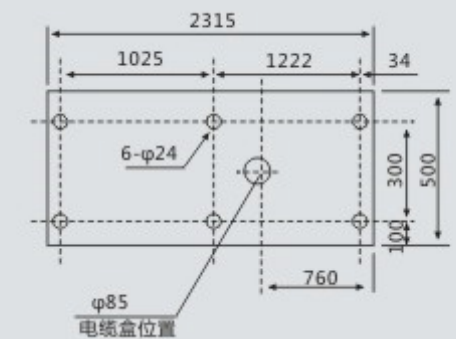
序号	项目	单位	数值	
1	额定电压	kV	35	
2	最高工作电压		40.5	
3	额定绝缘水平		min工频耐压	干式 95 湿式 80
			雷电冲击耐受电压(峰值)	185
4	额定电流	A	1600	
5	额定短路开断电流	KA	20、25、31.5	
6	额定电容器组开断电流	A	400、630	
7	额定操作顺序		0-0.3s-CO-180s-CO	
8	额定短路开断电流开断次数	次	12	
9	额定短路关合电流(峰值)	KA	50、63、80	
10	额定峰值耐受电流			
11	额定短时耐受电流		20、25、31.5	
12	额定短路开断持续时间	S	4	
13	全开断时间	ms	≤80	
14	机械寿命	次	10000	
15	额定操作电压	V	DC, AC; 110, 220	
16	额定操作电流(合闸)分闸	A	电磁机构: 147(DC220V)/294(DC110); 弹簧机构: 5(AC220V)	
17	动触头允许磨损厚度	mm	3	
18	重量	kg	750	

### 外形及安装尺寸 Shape and installation size



ZW7-40.5型真空断路器外形尺寸图

- 1.上出线端子 2.真空灭弧室 3.手孔盖板 4.下出线端子 5.支柱瓷瓶子 6.机构箱 7.门 8.吊环螺钉  
9.门把手 10.机构(箱内) 11.观察窗 12.绝缘拉杆 13.拐臂 14.支架 15.电流互感器 16.螺栓



ZW7-40.5型真空断路器外形基础示意图

# RW□-12

## 跌落式熔断器

### Drop fuse


**主要技术参数 Main technical parameters**

12kV-15kV

型号	额定电压 (kV)	额定电流 (A)	开断电流 (A)	冲击电压 (BIL)	工频耐压	爬距 (mm)	重量 (kg)	外形尺寸 (cm)
RW-33	15	100	10000	100	40	250	7.5	40×34.5 ×11
RW-33	15	200	12000	110	40	250	7.5	

15kV-27kV

型号	额定电压 (kV)	额定电流 (A)	开断电流 (A)	冲击电压 (BIL)	工频耐压	爬距 (mm)	重量 (kg)	外形尺寸 (cm)
RW10	15	100	10000	100	40	250	7.5	48×34.5 ×11
RW10	15	200	12000	110	40	250	7.5	

15kV-27kV

型号	额定电压 (kV)	额定电流 (A)	开断电流 (A)	冲击电压 (BIL)	工频耐压	爬距 (mm)	重量 (kg)	外形尺寸 (cm)
RW-24	24	100	8000	150	65	530	12	48×34.5 ×14
RW-24	24	200	10000	150	65	530	12	

12kV-15kV

型号	额定电压 (kV)	额定电流 (A)	开断电流 (A)	冲击电压 (BIL)	工频耐压	爬距 (mm)	重量 (kg)	外形尺寸 (cm)
RW-C	11	100	10000	100	40	250	7.5	42×34.5 ×11
RW-C	11	200	12000	110	40	250	7.5	

12kV-15kV

型号	额定电压 (kV)	额定电流 (A)	开断电流 (A)	冲击电压 (BIL)	工频耐压	爬距 (mm)	重量 (kg)	外形尺寸 (cm)
RW	11	100	6000	100	42	340	7.5	49×27 ×11.5
RW	11	200	8000	110	42	340	7.5	

# RW□-12

## 跌落式熔断器

### Drop fuse


**主要技术参数 Main technical parameters**

12kV-15kV

型号	额定电压 (kV)	额定电流 (A)	开断电流 (A)	冲击电压 (BIL)	工频耐压	爬距 (mm)	重量 (kg)	外形尺寸 (cm)
FSC-23	32	100	8000	170	70	820	27.5	68×17 ×15
FSC-23	32	200	10000	170	70	820	27.5	

10kV

型号	额定电压 (kV)	额定电流 (A)	开断电流 (A)	冲击电压 (BIL)	工频耐压	爬距 (mm)	重量 (kg)	外形尺寸 (cm)
RW11	12	100	6300	100	42	230	7.8	48×12 ×31
RW11	12	200	8000	110	42	230	7.8	

10kV

型号	额定电压 (kV)	额定电流 (A)	开断电流 (A)	冲击电压 (BIL)	工频耐压	爬距 (mm)	重量 (kg)	外形尺寸 (cm)
RW10	15	100	10000	100	40	250	7.5	48×34.5 ×11
RW10	15	200	12000	110	40	250	7.5	

10kV

型号	额定电压 (kV)	额定电流 (A)	开断电流 (A)	冲击电压 (BIL)	工频耐压	爬距 (mm)	重量 (kg)	外形尺寸 (cm)
RW10-10F	12	100	6300	110	42	260	7.5	53×32 ×12
RW10-10F	12	200	8000	110	42	260	7.5	

10kV

型号	额定电压 (kV)	额定电流 (A)	开断电流 (A)	冲击电压 (BIL)	工频耐压	爬距 (mm)	重量 (kg)	外形尺寸 (cm)
RW3	10	100	6300	100	42	230	6.2	48×27 ×12
RW3	10	200	8000	110	42	230	6.2	

# RW□-12

## 跌落式熔断器

### Drop fuse



#### 主要技术参数 Main technical parameters

15kV

型号	额定电压 (kV)	额定电流 (A)	开断电流 (A)	冲击电压 (BIL)	工频耐压	爬距 (mm)	重量 (kg)	外形尺寸 (cm)
HRW3	12	100	6300	100	42	380	8.8	61×13 ×42
HRW3	12	200	8000	110	42	380	8.8	

15kV

型号	额定电压 (kV)	额定电流 (A)	开断电流 (A)	冲击电压 (BIL)	工频耐压	爬距 (mm)	重量 (kg)	外形尺寸 (cm)
HPRWG2	12	100	6300	170	70	870	16	61×13 ×42
HPRW2	12	200	8000	170	70	870	16	

10kV

型号	额定电压 (kV)	额定电流 (A)	开断电流 (A)	冲击电压 (BIL)	工频耐压	爬距 (mm)	重量 (kg)	外形尺寸 (cm)
HRW11	12	100	6300	100	42	350	3.8	42×35 ×11
HRW11	12	200	8000	110	42	350	3.8	

10kV

型号	额定电压 (kV)	额定电流 (A)	开断电流 (A)	冲击电压 (BIL)	工频耐压	爬距 (mm)	重量 (kg)	外形尺寸 (cm)
SHY5WS	3	100	6300	100	42	350	3.8	42×35 ×11
SHY5WS	6	100	8000	110	42	350	3.8	
SHY5WS	10	150	6300	100	42	350	3.8	
SHY5WS	10	150	8000	110	42	350	3.8	

10kV

型号	额定电压 (kV)	额定电流 (A)	开断电流 (A)	冲击电压 (BIL)	工频耐压	爬距 (mm)	重量 (kg)	外形尺寸 (cm)
RW7	10	100	6300	110	42	230	6.2	48×27 ×12
RW7	10	200	8000	110	42	230	6.2	

# ZBW-12

## 户外组合箱式变电站 (欧式箱变)

### Outdoor box type substation (European box change)



#### 功能及特点 Functions and characteristics

- 高压开关设备、变压器、低压开关设备三位一体，成套性强。
- 高、低压保护完善，运行安全可靠，维护简单。
- 占地少，投资省、生产周期短、移动方便。
- 接线方案灵活多样。
- 结构独特：独特蜂窝式结构双层（复合板）外壳牢固，隔热又散热通风、美观、防护等级高，外壳材料有不锈钢钛合金、铝合金、冷轧板、彩钢板可选。
- 型式多样：通用型、别墅型、紧凑型等多种样式。
- 高压环网柜内可装配网自动化终端(FTU)实现短路及单相接地故障的可靠检测，具备“四遥”功能，便于配网自动化升级。
- High voltage switchgear, transformer and low voltage switchgear are three in one.
- High and low voltage protection is perfect, operation is safe and reliable, and maintenance is simple.
- The utility model has the advantages of less land occupation, low investment, short production cycle and convenient movement.
- The wiring scheme is flexible and varied.
- Unique structure: the unique honeycomb structure double layer (composite plate) shell is strong, heat insulation and heat dissipation ventilation, beautiful, high protection grade, the shell material of stainless steel titanium alloy, aluminum alloy, cold rolling plate, Color plate is optional.
- Various forms: general, villas, compact and so on.
- The reliable detection of short circuit and single-phase grounding fault can be realized by FTU in high voltage loop network cabinet. It has the function of "four remote", which is easy to upgrade the automation of distribution network.

#### 用途 Purpose

广泛用于城市电网改造、住宅小区、高层建筑、工矿、宾馆、商场、机场、铁路、油田、码头、高速公路以及临时性用电设施等户内外场所。

Widely used in urban power grid transformation, residential areas, high-rise buildings, industrial and mining, hotels, shopping malls, airports, iron roads, oil fields, wharves, highways, temporary electricity facilities and other indoor and outdoor premises.

#### 使用环境 Use of the environment

- 海拔高度不超过1000m。
- 环境温度：-25℃~+40℃。
- 相对湿度：日平均值不大于95%，月平均值不大于90%。
- 安装场所：无火灾、爆炸危险、导电尘埃、化学腐蚀性气体及剧烈震动的场所，若超出以上条件时，用户可与我公司协商。
- The altitude is not more than 1000m.
- Ambient temperature: -25℃ ~ +40℃.
- Relative humidity: the daily average value is not greater than 95%, and the monthly mean value is not greater than 90%.
- Place of installation: no fire, explosion hazard, conductive dust, chemical corrosive gas and severe vibration. If the above conditions exceed the above conditions, users can consult with our company.

#### 变压器 Transformer

智能型一体化变电站选用低损耗、油浸式、全密封S9、S10、S11系列变压器，也可选用树脂绝缘或NOMEX纸绝缘环保型干式变压器，底部可配有小车，变压器可方便地进出。

The intelligent integrated substation selects the low loss, oil immersion, all sealed S9, S10, S11 series transformers, also can choose the resin insulated or NOMEX paper insulation dry type transformer, the bottom can be equipped with small cars, the transformer can be easily and out.

#### 高压侧 High pressure side

智能型一体化变电站高压一般采用负荷开关—熔断器组合电器保护，熔断器—相熔断后，三相联动脱扣，负荷开关有压气式、真空、六氟化硫等型式可选，可配电动操作机构，实现自动化升级；熔断器为高压限流熔断器，带撞击器，动作可靠，开断容量大，主要技术参数见下表。对于800kVA以上的变压器，可选用ZN12、ZN28、VS1等真空断路器保护。

In the intelligent integrated substation, the high voltage of the integrated substation generally adopts the combination of the load switch and the fuse combination. After the fuse is fused, the three-phase linkage is removed, the load switch has the type of pressure gas, vacuum and six sulfur fluoride, which can be equipped with electric operating mechanism to realize automatic upgrading; the fuse is a high voltage current limiting fuse and a collision. The jar is reliable and has large capacity. The main technical parameters are shown in the table below. YesFor transformers above 800kVA, ZN12, ZN28, VS1 and other vacuum circuit breakers can be selected for protection.

#### 低压侧 Low pressure side

低压侧主开关采用万能式或智能型断路器，选择性保护；出线开关选用新型塑壳式开关体积小、飞弧短，最多可达30回路；智能型自动跟踪无功补偿装置，有接触器和无触点两种投切方式供用户选用。

The main switch of the low voltage side adopts the universal type or the intelligent type circuit breaker for selective protection; the outlet switch selects the new plastic shell type switch with small volume and short arc, up to 30 circuits; the intelligent automatic tracking reactive compensation device, the contactor and the contactless two kinds of switching modes are used for the user to choose.

**执行标准 Standard of execution**

本产品符合下列标准：

GB/T17467-1998 《高压 / 低压预装式变电站》

DL/T537-93 《6-35kV箱式变电站订货技术条件》

This product meets the following standards:

GB/T17467-1998 《High voltage / low voltage pre installed substation》

DL/T537-93 《6-35kV box substation order technology conditions》


**负荷开关技术参数 Technical parameters of load switch**

序号	名称	单位	FN12-12负荷开关	FZM12-12真空负荷开关
1	额定电压	KV		10
2	最高工作电压	KV		12
3	额定频率	Hz		50
4	额定电流	A		630
5	额定开断负荷电流	A		630
6	热稳定电流 (有效值)	KA/S	20/2	20/4
7	动稳定电流	KA	50	50
8	短路关合电流 (峰值)	KA	50	50
9	满负荷开断次数	次	20	10000
10	机械寿命	次	2000	10000
11	1min工频耐压 (相间及对地)	KV	42	42
12	雷电冲击电压 (相对及对地)	KV	75	75

**高压熔断器技术参数 Technical parameters of high voltage fuse**

型号		额定电压(KV)	开断电流(A)	开断电流 ( KA )	熔体额定电流 ( A )
英国型号	国内型号				
SDL×J		12	40	31.5	6.3,10,16,20,25,31.5,40
SFL×J	XRNT-12	12	100	31.5	50,63,71,80,100
SKL×J		12	125	31.5	125

\*注：由是否安装撞击器确定，N为无撞针，A为有撞针。

\* Note: N is a non firing pin and A is a firing pin.

型号	脱扣器形式	脱扣器额定电流A	通断能力KA(AC380V)
DW15-630	热-电磁性 或电子型	315,400,630	40
DW15-1000		630,800,1000	50
DW15-1600		1600	50
DW15-2500	智能型	1600,2000,2500	60
CW1-2000		630,800,1000,1250,1600,2000	65(80)
CW1-3200		2000,2500,3200	100

**一次方案图 Primary scheme diagram**

● 变电站一次方案参见附图。

A plan for a substation is referred to in the attached drawings.

典型方案示例图参见附图

**The example diagram of a typical scheme is shown in the accompanying drawings**

● 典型方案示例图参见附图。

The example diagram of a typical scheme is shown in the accompanying drawings

**基础与平面布置图 Foundation and plane layout**

● 变电站基础图参见附图；变电站平面布置参见附图，用户可根据需要选用。

Refer to the drawings of the substation foundation plan; the layout of the substation can be selected according to the requirements.

**安装、使用与维修 Installation, use and maintenance**

智能型一体化变电站在安装、验收、交接性试验、运行与维护等方面除电力部门要求执行的各项规定外，注意以下事项：

In the aspects of installation, acceptance, handover test, operation and maintenance of the intelligent integrated substation, the following items should be paid attention to in addition to the requirements of the power department.

● 用户收货时应按有关规定仔细检查，对于不马上安装的产品，应按正常使用条件规定，存放于适当的场所。

When receiving the goods, users should check them carefully according to the relevant regulations. For products not immediately installed, they should be stored in suitable places according to the normal conditions of use.

● 产品应采用专用吊具底部起吊，如图3。

The product should be hoisted at the bottom of the special sling, as shown in Figure 3.

● 产品水平安放在事先做好的基础上，然后将产品底座与基础之间的缝隙用水泥沙浆抹封，以免雨水进入电缆室，通过高、低压室的底板接入高、低压电缆。

The product level is laid on the basis of the pre - done, and then the gap between the base and the base is covered with cement mortar, so as to avoid the rain entering the cable room and access the high and low voltage cables through the bottom sealing plate of the high and low pressure chambers.

● 产品安装就位后应做好可靠接地；电站底座槽钢上的两个主接地端子、变压器中性点及外壳、避雷器下桩头等均应分别由安装部门接地。所有接地应共用一组接地装置，其接地电阻应小于4欧姆，从接地网引至本产品的接地引线应不少于两条。

The reliable grounding should be made after the installation of the product, and the two main grounding terminals on the station's base channel, the neutral point and the shell of the transformer and the head of the lightning arrester should be grounded by the installation department respectively. All grounding shall share a set of grounding devices, the grounding resistance should be less than 4 ohms, and the grounding lead from the grounding net to this product should be no less than two.

● 产品在安装完毕或维修后，投运前应进行如下项目的检验和试验：

After The Product Is Installed Or Repaired, The Following Items Shall Be Tested And Tested Before Commissioning.

1. 变电站内是否清洁。

The Substation Is Clean.

2. 操作机构是否灵活。

The Operating Mechanism Is Flexible.

3. 主要电器的通断是否灵活可靠。

Main Electrical Appliances Are Flexible And Reliable.

4. 电器辅助触点的通断是否可靠准确。

The Electrical Auxiliary Contacts Are Reliable And Accurate.

5. 表计及继电器动作是否准确无误。

Meter And The Relay Action Is Accurate.

6. 仪表及互感器的变比及接线极性是否正确。

The Ratio Of Instrument And Transformer And The Polarity Of Wiring Are Correct.

7. 所有电器安装螺母是否拧紧，安装是否牢固可靠。

Whether All Electrical Installation Nuts Are Tightened And Whether The Installation Is Solid And Reliable.

8. 母线连接是否良好，其支撑绝缘子，夹件是否安装可靠。

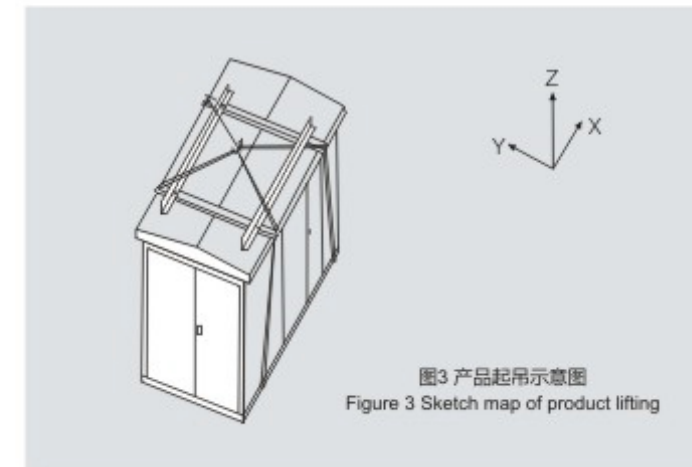
Whether The Bus Connection Is Good, Whether The Supporting Insulators And The Clamps Are Reliable.

9. 电器的整定值是否符合要求，熔断器熔芯规格是否正确。

Whether The Setting Value Of Electrical Appliances Meets The Requirements, And Whether The Fuse Core Specification Is Correct.

10. 主电路及辅助电路的接点是否符合电气原理图要求。

Is The Contact Between The Main Circuit And The Auxiliary Circuit Conforming To The Requirements Of The Electrical Schematic Diagram

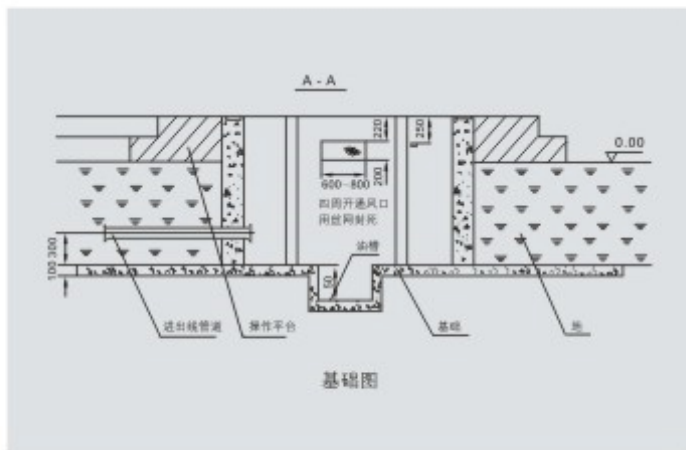
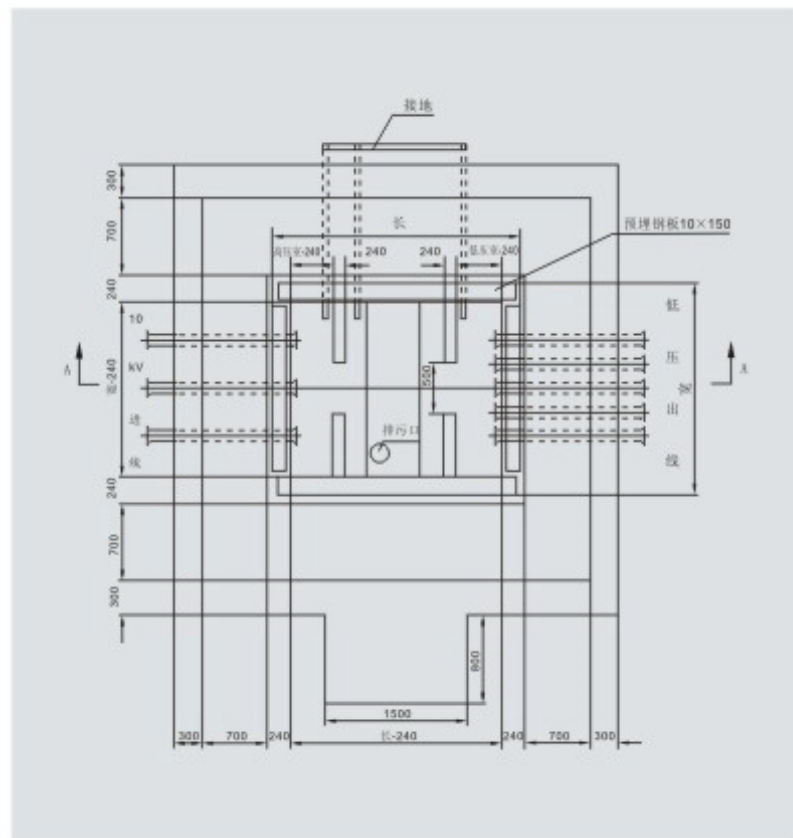

 图3 产品起吊示意图  
 Figure 3 Sketch map of product lifting

**维修 Repair**

1. 产品中所有元件按各自的技术要求维护。  
All Components In The Product Are Maintained According To Their Technical Requirements.
2. 若选用的变压器为油浸式，每年应按规定至少进行一次油样分析检查。  
If The Transformer Is Oil Immersed, The Oil Sample Analysis Should Be Conducted At Least Once A Year.
3. 运行中的高压侧开关设备，经20次带负荷或2000次无负荷分合闸操作后，应检查触头情况和灭弧装置的损耗程度，发现异常应及时检修或更换。  
Operation Of High Voltage Side Switch Equipment, After 20 Load Or 2000 Times No Load Switching Operation, Should Check The Contact Situation And The Loss Of The ArcExtinguishing Device, Found That The Abnormal Should Be Repaired Or Replaced In Time.
4. 低电压开关设备自动跳闸后，应检查分析跳闸原因，待排除故障后，方能重新投运。  
After The Automatic Trip Of The Low Cost Switchgear, The Reason For Tripping Should Be Checked And Analyzed.
5. 避雷器每年应在雷雨季节到来之前进行一次预防性试验。  
Lightning Arresters Should Be Tested Annually Before The Thunderstorm Season.

**基础 Basics**

- 地基耐力要求1000pa以上。
- 基础设在地势较高处，四周向外排水，采用200#水泥砂浆砌筑，掺3%防水剂，底部向油槽略有倾斜(干变时取消油槽)。
- 基础施工应符合JGJ1683《建筑电气设计技术规程》有关规定。
- 接地干线及接地极的作法按常规做，接地电阻 $\leq 4\Omega$ 。
- 图中尺寸为推荐值。
- The foundation stamina requires more than 1000Pa.
- The foundation is located at the height of the terrain, and is drained out all around. 200# cement mortar is used for masonry, with 3% waterproofing agents, and the bottom.
- A slight tilt to the oil tank (canceling the oil tank when dry).
- The basic construction shall comply with the relevant provisions of the JGJ1683 "technical regulations for building electrical design".
- The grounding lines and grounding poles are routinely done and the earth resistance is less than 4 ohms.
- The size in the figure is the recommended value.


**基础图 Basic diagram**

**技术方案图例 Primary scheme diagram**

附1、高压典型方案

方案号	H01	H02	H03
主回路单线图			
用途	终端型 电缆进线/一回出线	终端型(倒)进线	终端型架空进线
柜型	HXGN-12	HXGN-12	HXGN-12
一次设备选型	真空断路器ZN28, VS1 负荷开关FN, FZN, FLN 隔离开关GN 熔断器XRNT 熔断器RN2 避雷器HY5W 带电显示器GSN 电流互感器LZZBJ 电压互感器JDZ	1 1 3 3 3 1 1	1 3 3 1

附1、高压典型方案(续表)

方案号	H04	H05	H06
主回路单线图			
用途	终端型 真空断路器进线	终端型 进线计量一回出线	终端型 电缆进线一回出线计量
柜型	HXGN-12	HXGN-12	HXGN-12
一次设备选型	真空断路器ZN28, VS1 负荷开关FN, FZN, FLN 隔离开关GN 熔断器XRNT 熔断器RN2 避雷器HY5W 带电显示器GSN 电流互感器LZZBJ 电压互感器JDZ	1 1 2 3 3 3 1 1 2	1 3 3 3 1 2 2

变电站结构图 Substation structure diagram



