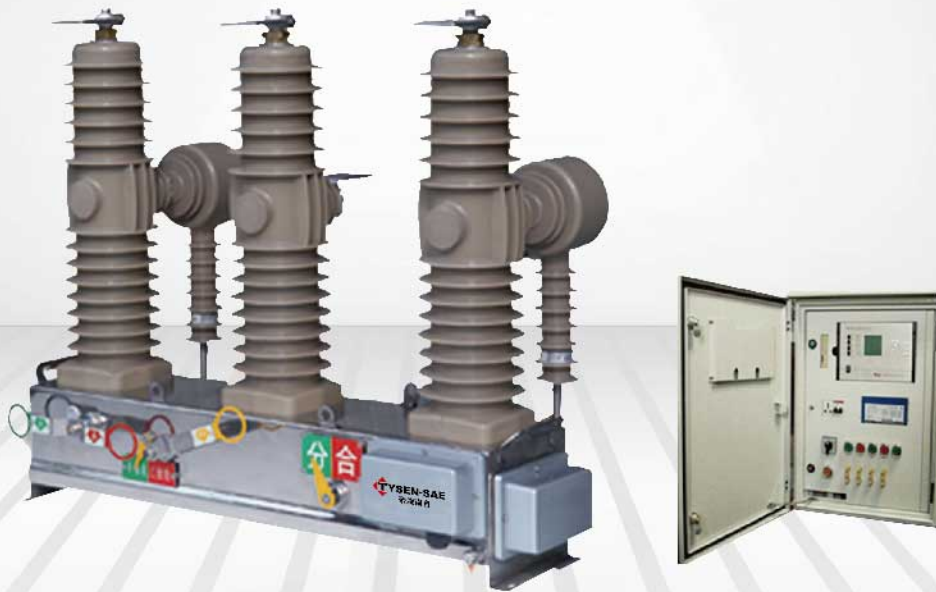


# ZW139/12-D系列永磁式户外真空断路器

## ZW139/12-D Series Permanent Magnet Outdoor Vacuum Circuit Breaker



### 产品特点

- ▶ 国际独创，双接触面，闭环磁路永磁操作机构，寿命长，可靠性高；
- ▶ 国内最具信任度的帝森南自馈线自动化终端（FTU），满足配网自动化需求，可实现各种测量，保护控制以及遥测、遥信、遥调、遥控等功能；
- ▶ 强大的通讯处理功能：
  - RS232接口：实现就地参数设定和编程；
  - 光MODEM模块：传输速率高，可靠性高，方便实现配电网自动化系统组网；
  - GSM、GPRS/CDMA模块：实现位置分散终端设备，简易可靠，组网运行；
- ▶ 可靠隔离刀闸与本体构成机械联锁，具有明显断口，维护方便安全。

### Product Features

- ▶ International creative, double contact surfaces, closed magnetic circuit permanent magnet operating mechanism, long service life, and high reliability;
- ▶ The TYSEN-SAE feeder automation terminal (FTU) with the best level of trust at home can meet the demands for distribution network automation, enabling a variety of functions including measurement, protection and control, and telemetry, remote communication, remote adjustment, and remote control;
- ▶ Powerful communications processing functions:
  - RS232 interface: Achieve local parameter setting and programming;
  - Optical MODEM module: high transfer rate, high reliability, easy to achieve system networking of distribution network automation;
  - GSM, and GPRS/CDMA module: Realize location-scattered terminal equipment, having advantages of simple and reliable, and network operation;
- ▶ Reliable isolation switch and the circuit breaker body form into mechanical interlock, featuring obvious fracture, easy maintenance and safety.

### 结构特点及工作原理

断路器经全新的小型化设计，采用全封闭结构，独特的灭弧室封装设计，密封性能好，有助于提高防潮、防凝露性能、适用于高温、潮湿地区使用。

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、使用寿命长等特点。

断路器配置了智能开关控制器，设有三段式电流保护，零序保护，重合闸、速断保护等多种保护功能。它支持多种通讯协议，允许选用多种通讯方式构成通讯网，既可对开关进行本地手动或遥控操作，也可通过通信实现远方遥控。如配用相应的重合器或分段器控制装置，可作为重合器或分段器使用。

### Structural Characteristics and Working Principle

Upon new compact design, the circuit breakers are in totally enclosed structure, unique interrupter packaging design, and excellent sealing, which helps improve the resistance against moisture and condensation, and suitable for use in hot and humid regions.

The circuit breakers are characterized by stable and reliable performance, free of fire and explosion hazard, safety, maintenance-free, compact size, light weight, and long service life.

The circuit breakers are equipped with intelligent switch controller, and provide protection features including three-phase current protection, zero-sequence protection, reclosing, and instantaneous trip protection. It supports multiple communication protocols, allowing options of a variety of communication modes in forming communications networks, which enables the local manual or remote operation of switches, and can also realize remote control via communication. If the appropriate recloser or sectionalizer control device is equipped, it can also be used as recloser or sectionalizer.

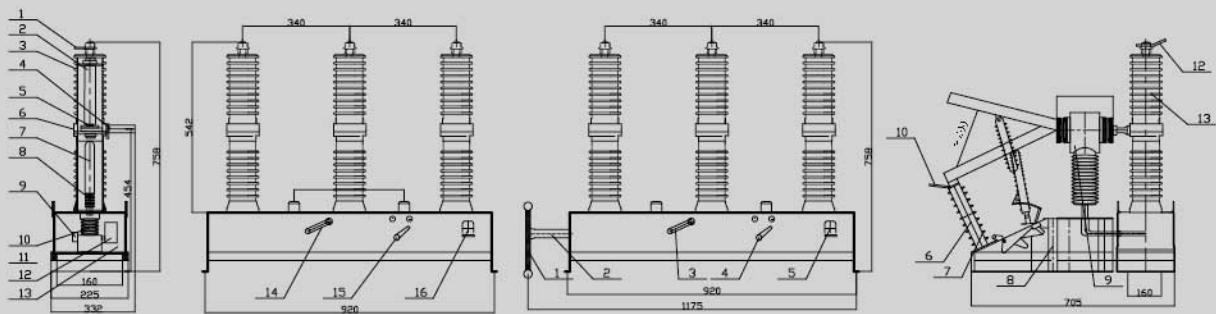


产品结构 Product Structure

断路器内由装有高压系统及其操作系统的主基箱、操作机箱和供安装、固定、搬（吊）运用的悬架三部分组成，外形结构见图1。

The circuit breaker is internally composed of three parts: the main base box housing HV system and its operating system, operation cabinet, and the suspension for installation, fixing, and moving (lifting), with exterior structure as shown in Figure 1.

图1 断路器接头及外形尺寸  
Figure 1 Circuit Breaker Connection and Outside Dimensions



- 1、上出线 Top outlet
- 2、灭弧室 Interrupter
- 3、绝缘筒 Insulating cylinder
- 4、下出线 Bottom outlet
- 5、导电夹 Conductive holder
- 6、软连结 Flexible link
- 7、绝缘拉杆 Insulated rod
- 8、触头压力簧 Contact pressure spring
- 9、分闸弹簧 Opening spring
- 10、驱动杆焊接 Welding of drive rod
- 11、机构输出轴 Mechanism output shaft
- 12、操作机构 Operating mechanism
- 13、基箱 Base box
- 14、分闸手柄 Opening lever
- 15、分合指示 Opening/closing indicator
- 16、接线插头 Wiring plug

- 1、隔离操作手柄 Isolation operating lever
- 2、隔离开关主轴 Isolation switch spindle
- 3、断路器分闸手柄 Circuit breaker opening lever
- 4、分合指示 Opening/closing indicator
- 5、接线插头 Wiring plug
- 6、绝缘子 Insulator
- 7、绝缘拉杆 Insulation pull rod
- 8、支架 Bracket
- 9、电流互感器 Current transformer
- 10、接线板（进线端） Wiring board (inlet end)
- 11、隔离刀片 Separator blade
- 12、接线出线端 Wiring outlet end
- 13、断路器 Circuit breaker

对于需要加装隔离开关的用户，可选用ZW139-12DG系列开关，外形尺寸及结构见图1。隔离开关用螺栓固定于原开关基箱上，可灵活加装。

For users requiring installation of switch disconnector, ZW139-12DG series switches can be selected, with outside dimensions and structure as shown in Figure 1. The switch disconnector is bolted to the original switch base box and can be flexibly mounted.

### 隔离开关结构特点

隔离开关由支架8、绝缘子6、绝缘拉杆7、刀片11、主轴2、进线板10、操作手柄1等组成。支架固定在机箱上。利用接线端作为闸刀的支点，成为隔离断口的一端，断口的另一端通过操作绝缘拉杆驱动轴打开、关合刀闸，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之间的可靠防误机械联锁，维护方便、安全。

### 永磁操动机构结构及原理

断路器采用帝森南自系列永磁操动机构，它是一种由电磁驱动、永磁保持、电子控制的操动装置。其独特之处在于由永久磁铁实现机构终端位置的保持工作，取代了传统的机械脱扣和锁扣装置。无故障源，具有很高的可靠性。

### 使用环境条件

- ▶ 环境温度：-40℃~+60℃
- ▶ 污秽等级不大于IV级
- ▶ 海拔高度不超过1000m
- ▶ 风压不超过700Pa（相当于风速34/s）
- ▶ 无火灾、爆炸、化学腐蚀的场所
- ▶ 无经常性的剧烈震动、地震强度不超过8级

### Structural Features of Switch Disconnector

The switch disconnector consists of the bracket 8, insulator 6, insulating rod 7, blade 11, spindle 2, inlet board 10, and operating lever 1. The bracket is fixed to the cabinet. The inlet end is used as the fulcrum of the isolator, and serves as one end of the isolated fracture, while the other end of the fracture drives the shaft to open and close the isolator by operating the insulating rod while the fracture is obviously visible under opening state of the switch disconnector and reliable anti-error mechanical interlock with the circuit breaker is realized, thereby offering the advantages of easy maintenance and safety.

### Structure and Principle of Permanent Magnet Actuator

The circuit breaker shall be TYSEN-SAE series permanent magnet actuator, which is an electromagnetic-driven, permanent magnetism retaining, and electronically controlled actuator device. Its uniqueness lies in that the retention work at the mechanism end position is realized by the permanent magnetism, replacing the traditional mechanical tripping and locking devices. The circuit breaker has advantages of trouble-free source, and excellent reliability.

### Environmental Conditions for Use

- ▶ Ambient temperature: -40℃~+60℃
- ▶ The contamination level is not inferior to Level IV.
- ▶ The altitude is not more than 1,000m.
- ▶ The wind pressure does not exceed 700Pa (equivalent to wind speed of 34/s)
- ▶ Places free of fire, explosion, and chemical corrosion
- ▶ No frequent severe vibration, and seismic intensity of not greater than M8



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## 主要规格及技术参数 Main Specifications and Technical Parameters

### 断路器的主要技术参数

#### Main Technical Parameters of Circuit Breaker

序号 No.	名称 Description	单位 Unit	参数 Parameters
1	额定电压 Rated voltage	kV	12
2	额定工频耐受电压相间、相对地/断口 (1min) Rated power frequency withstand voltage (1 min)	kV	42/48
3	额定雷电冲击电压相间、相对地/断口 (峰值) Rated lightning impulse withstand voltage	kV	75/85
4	额定电流 Rated current	A	630, 1250
5	额定频率 Rated frequency	Hz	50
6	额定短路开断电流 Rated short-circuit breaking current	kA	20
7	额定短路关合电流 (峰值) Rated short-circuit making current (peak)	kA	50
8	额定峰值耐受电流 Rated peak withstand current	kA	50
9	(4S) 额定短时耐受电流 (4S) Rated short-time withstand current	kA	20
10	额定操作顺序 Rated operating sequence		0.3s 180s 0—CO—CO
11	合闸时间 Closing time	ms	20~60
12	分闸时间 Opening time	ms	20~55
13	额定短路开断电流开断次数 Breaking operations of rated short-circuit breaking current	次 Number of cycles	30
14	机械寿命 Mechanical life		10000
15	二次回路1min工频耐压 Secondary circuit 1min power frequency withstand voltage	V	2000
16	额定合闸操作电压 Rated closing operating voltage	V	AC DC 220 110
17	额定分闸操作电压 Rated opening operating voltage	V	AC DC 220 110



## 断路器的主要机械特性

## Main Mechanical Characteristics of Circuit Breaker

序号 No.	名称 Description	单位 Unit	参数 Parameters
1	触头行程 Contact travel	mm	$9 \pm 1$
2	触头超行程 Contact over-travel	mm	$2.5 \pm 0.5$
3	相间中心距 Center distance between phases	mm	$340 \pm 1.5$
4	触头合闸弹跳时间 Bouncing time of contactor closed	ms	$\leq 2$
5	三相分合闸不合期 Time interval between opening of first and last phase of three phase circuit-breaker	ms	$\leq 2$
6	平均分闸速度 Average opening speed	m/s	$1.2 \pm 0.2$
7	平均合闸速度 Average closing speed	m/s	$0.6 \pm 0.2$
8	每相导电回路电阻 Phase-wise conductive loop resistance	$\mu \Omega$	$\leq 80$

## 隔离开关主要技术参数

## Main Technical Parameters for Switch Disconnecter

序号 No.	名称 Description	单位 Unit	参数 Parameters	
1	额定电压 Rated voltage	kV	12	
2	额定电流 Rated current	kA	630、1250	
3	4S额定短时间耐受电压(最大值) 4S Rated short-time withstand voltage (max)	kA	20	
4	额定峰值耐受电流 Rated peak withstand current	kA	40、50	
5	1min工频耐受电压 1min power frequency withstand voltage	对地、相间 Phase-to-ground and phase-to-phase	kV	42
		断口 Fracture	kV	48
6	回路电阻(断路器接线板至隔离开关进线板) Loop resistance (from circuit-breaker patch panel to switch disconnecter inlet panel)	$\mu \Omega$	$\leq 120$	
7	三相刀闸合闸时中心偏向摆度 Center displacement run-out of three-phase isolator when closing	mm	$\leq 2$	
8	三相刀闸分、合闸同期性偏差 Tolerance of synchronous time between opening of first and last phase of three-phase isolator	mm	$\leq 2$	
9	导电部分对地绝缘距离 Conductive part-to-ground insulation distance	mm	$\geq 160$	
10	断口开距 Fracture spacing	mm	$\geq 200$	
11	质量 Mass	kg	30	

备注：额定短时耐受电流因互感器变比的不同而不同 Remarks: Rated short-time withstand current varies with the transformer ratio.