



产品概述

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ZN63A-12(VS1)

户内交流中压真空断路器

Low-Voltage Withdrawable Switchgear Cubicle



概述

ZN63A-12(VS1)户内交流中压真空断路器适用于三相交流50Hz, 10KV 的电力系统中作投切各种不同性质的负荷及频繁操作的场合, 可供工矿、企业、发电厂及变电站电气设备的保护和控制之用。

可配用KYN28-12(GZS1)等中置手车式开关柜, 也可配于XGN-□固定式开关柜。

本产品符合国家标准GB1984《交流高压断路器》、JB3855《3.6-40.5KV 户内交流高压真空断路器》和IEC60056《高压交流断路器》标准。满足DL/T403《12-40.5KV户内交流高压真空断路器订货技术条件》。

General

ZN63A-12 (VS1) Indoor AC Medium Voltage Vacuum Circuit Breaker is suitably applied in AC three phase 50Hz, 10kV power systems for switching over loads in different nature in frequent operation situations. It is generally used in industrial and mineral enterprises, power plants and substations for protection and control of their electrical apparatus.

It can be mounted both in various central-located truck type switchgears such as KYN28 - 12 (GZS1) and in fixed type switchgears such as XGN - □.

This product is manufactured in compliance with China National Standard GB1984 "AC High Voltage Circuit Breaker", China Ministerial Standard JB3855 "3.6 - 40.5 kV Indoor AC High Voltage Vacuum Circuit Breaker" and International Electric Engineering Commission Standard IEC "High Voltage AC Circuit Breaker" as well as DL/T403 "Ordering Conditions on 12 - 40.5 kV Indoor AC High Voltage Vacuum Circuit Breakers".

型号及含义 Type designation

- Z 真空断路器(Vacuum circuit breaker)
- N 户内(Indoor)
- 63A 设计序号(Design serial number)
-
- 12 额定电压Rated voltage (KV)
- /
- 操动机构代号, T 为弹簧操动机构(Symbol for operating mechanism, T for spring operating mechanism)
-
- 额定电流 Rated current (A)
-
- 额定短路开断电流Rated short circuit breaking current (KA)

使用环境条件 Working conditions

- * 环境温度Ambient temperature: $-10^{\circ}\text{C} \sim +40^{\circ}\text{C}$
- * 相对湿度 Relative humidity :
 - 日平均相对湿度 Daily average: $\leq 95\%$
 - 月平均相对湿度 monthly average: $\leq 90\%$
 - 日平均饱和蒸汽压 $\leq 2.2 \times 10^{-3}\text{Mpa}$
 - Daily average saturate vaporpressure

月平均饱和蒸汽压: $\leq 1.8 \times 10^{-3}\text{Mpa}$
Monthly average saturate vapor pressure

- * 海拔高度 Altitude above sea level: 2000m 及以下
 - * 地震烈度 Earthquake intensity: 不超过 8 度
- 使用场所无易燃易爆、危险、化学腐蚀及剧烈振动。

In places where there is no potential inflammable nor explosive articles, no dangerous nor chemical corrosive mediums, nor severe vibration.

我公司已开发出适用于海拔的产品，供用户选用。
Higher altitude products have been recently developed for option of our customers.

主要技术参数 Main technical parameters

ZN63A-12(VS1)真空断路器主要技术参数见下表

序号	名称		单位	型号				
				ZN63A-12-20	ZN63A-12-25	ZN63A-12-32	ZN63A-12-40	ZN63A-12-50
1	额定电压		kV	12				
2	额定电流		A	630 1000 1250	630 1000 1250	630 1000 1250	1600 2000 3150	3150 4000
3	1min 工频耐压	相间相地	kV	42				
		断口		48				
4	雷电冲击 耐压	相相地	kV	75				
		断口		84				
5	额定短路开断电流		kA	20	25	31.5	40	50
6	额定短路开断电流开断次数		次	50	50	50	40	50
7	直流分量百分数					40%	40%	45%
8	额定动稳定电流（峰值）		kA	50	63	100	100	130
9	4S热稳定电流		kA	20	25	31.5	40	50
10	额定操作顺序			★	★	★	☆	☆
11	额定失步开断电流		kA			12.6	16	20
12	额定异相接地故障开断电流		kA	17.3	21.7	27.4	34.6	43.3
13	额定单个电容器组开断电流		A	630				
14	额定背对背电容器组开断电流		A	400				

★ O-0.3s-CO-180s-CO ☆ O-180s-CO-180s-CO

储能电机For energy charging motor

采用永磁式单相直流电动机，其技术参数（见下表）

型号	额定电压 (V)	额定输出功率(W)	正常工作电压范围 (V)	额定电压下储能时间 (S)
ZYJ55-1	DC110 DC220	70	80%-110%额定电压	≤ 10

* 操作电压允许采用交、直流电源

分、合闸线圈技术参数（见下表） For open and trip coils

	合闸线圈	分闸线圈	备注
额定操作电压 (V)	DC220, DC110 AC220, AC110	DC220, DC110 AC220, AC110	分闸线圈 在小于 30%额定操 作电压时， 不得分闸
线圈功率 (W)	368	368	
正常工作电压范围 (V)	交流85%-110%额定电压 直流80%-110%额定电压	交流85%-120%额定电压 交流85%-110%额定电压	

结构特点

- * 断路器的灭弧室与操作就部分采用前后配置方式，通过传动机构连接为一个整体，以保证断路器的总体配合性能。
- * 采用中封式陶瓷真空灭弧室，铜铬触头材料及纵磁场触头机构为当今世界公认的最先进的熄

Structure features

- * Forward and backward configuration of interrupter and operating mechanism with drive link to ensure the general coordination performance of the circuit breaker as a whole.
- * Sealed ceramic and porcelain vacuum interrupter, Cu-Cr contact material and longitudinal magnetic field

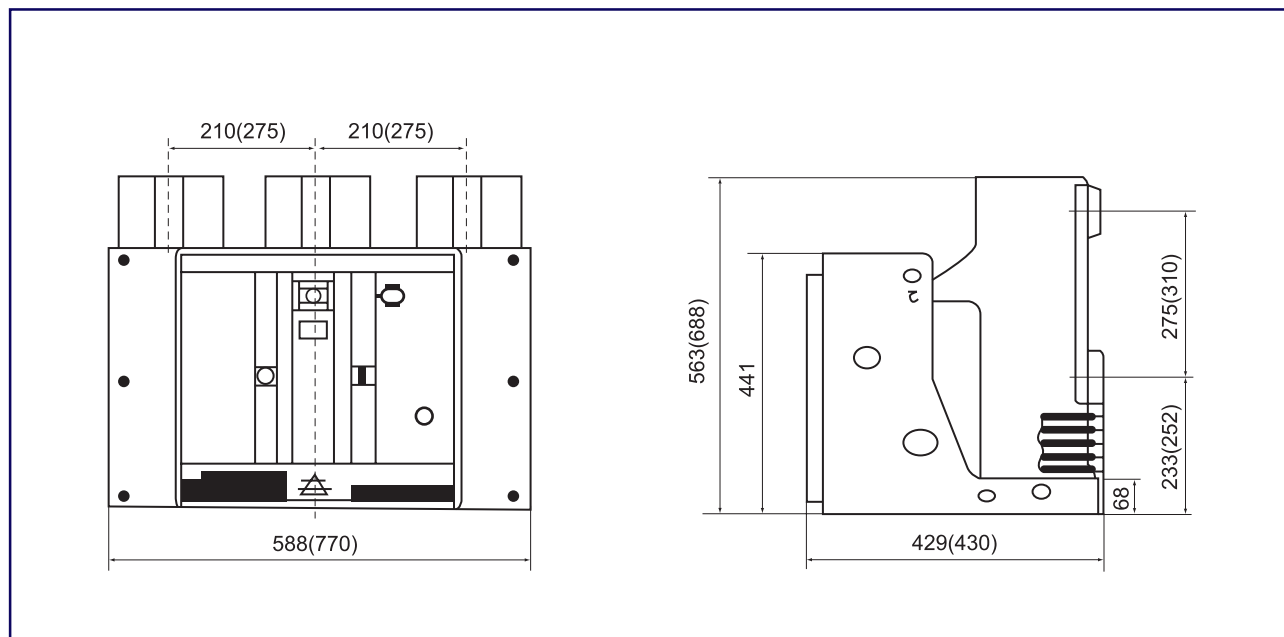
弧方式。

- * 真空灭弧室装在采用APG新工艺成型的绝缘筒内，不仅缩小了断路器的整体尺寸，还防止了异物对灭弧室的损伤和表面污染。
- * 绝缘筒在接见国外同类产品优点的基础上，增设内裙边和加强筋，提高了绝缘水平的抗动稳定电流的能力。
- * 操动机构采用弹簧储能式，具有电动和手动储能两种功能，断路器工作时储能弹簧的能量通过输出凸轮传递给连杆机构，再通过连杆就传递到动触头部分。
- * 先进合理的缓冲装置，分闸无反弹，减弱分闸冲击和震动。
- * 无需调整，极少维护或免维护。
- * 机构寿命高达 20000 次。

are worldwide recognized as the most advanced arc extinguishing strategy.

- * The vacuum interrupter mounted in an insulating column formed by APG, a new processing technology, not only reduces the whole dimension of the circuit breaker, but also prevents of the interrupter from injury and surface pollution by foreign objects.
- * On basis of advantage of similar foreign products, the insulating column with internal shed and re-enforcement ribbon greatly boosts the capacity of peak value withstand current in terms of insulating level.
- * Spring operating mechanism with both motor-driven and manual-operated modes. When the circuit breaker is in operation, the energy of the energy charging spring transmits to the pull rod assembly via an output cam, and then from the pull rod to the movable contact.
- * The advanced and reasonable damping device makes no bounce in opening operation and attenuates opening impulse and shock.

外形及安装尺寸 Overall and installation dimensions



注：()里的参数是ZN63A-12/□-40kA的

Note: The figures in the parenthesis above are for ZN63A-12/□-40kA.

订货须知

用户在订货时应注明：

- * 断路器的型号、名称及订货数量
- * 断路器额定电压、额定电流及额定短路开断电流

Information given when ordering

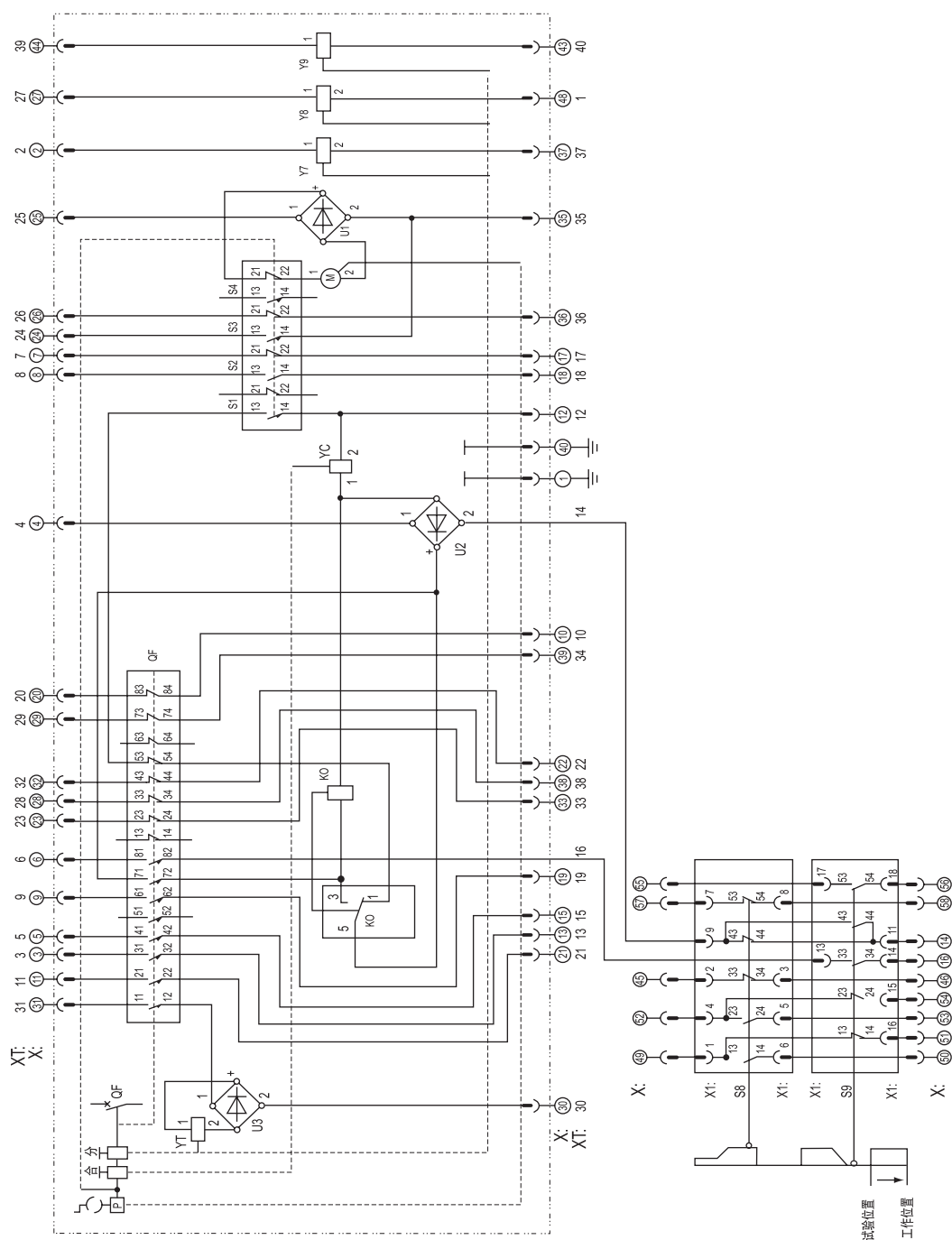
When ordering, customers are supposed to note the following information:

- * Type, name and quantity of the circuit breaker
- * Rated voltage, rated current and rated short circuit

- * 额定操作电压
- * 备品、配件的名称及数量
- * 若是高海拔产品，请注明海拔高度
- * 用户若有其它特殊要求，可在订货时说明

breaking current

- * Rated operating voltage
- * Name and quantity of spare parts, assembly parts
- * If the product is used at higher altitude above sea level other than mentioned above in this section, please note the actual value.
- * Other particular requirements of our customers may be remarked when ordering.



VS1⁺

户内交流中压真空断路器

Low-Voltage Withdrawable Switchgear Cubicle



应用

VS1⁺户内高压真空断路器是在原VS1型产品的基础上,为进一步实现真空断路器的小型化,高可靠、免维护而全新设计的新一代改进型产品。

VS1⁺户内高压真空断路器适用于各种不同性质的负荷及频繁操作的场所,可供工矿企业、发电厂及变电站电气设施的保护和控制之用。

操作机构采用模块式弹簧操作机构,与断路器本体一体化的设计,既可作为固定安装单元,也可组成手车单元使用。

特征

可靠的机械及电气联锁系统保证了操作及维护的安全性。智能化的控制单元代表了未来断路器的发展方向。简单的操作机构使结构更合理,零部件更少,各传动摩擦部位全面采用长效润滑脂和无油轴承,零部件表面经特殊处理,进一步提高了机构的可靠性,保证了产品长期使用的免维护。产品符合GB1984/JB3855/DL402/DL403/IEC等相关标准。

Operation

The design of VS1⁺ series of vacuum circuit breaker (VCB) is based on the original VS1 model. The improved design is to make the VCB smaller, more reliable and maintenance-free.

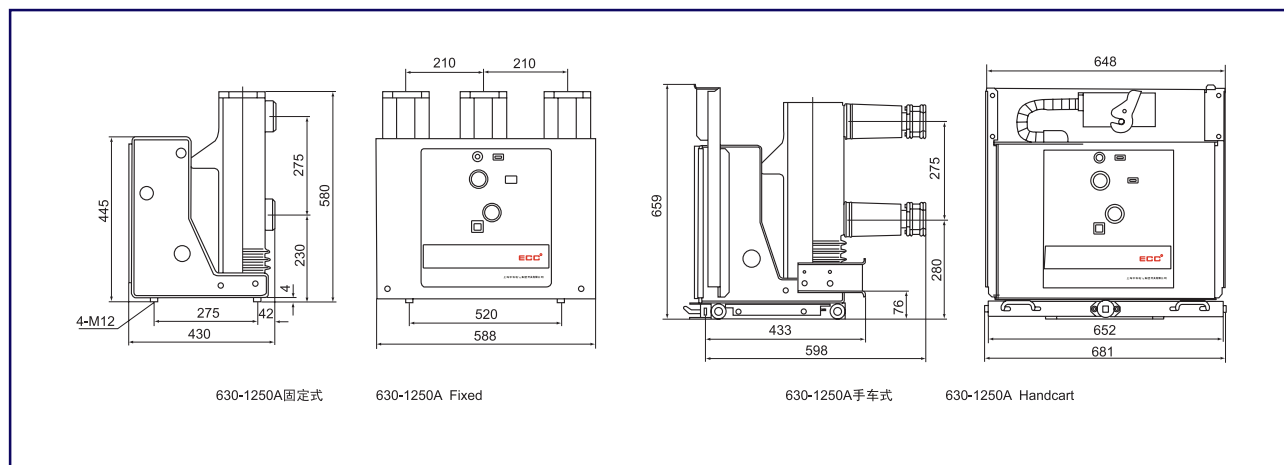
VS1⁺ series indoor VCB are suitable for different loads and frequent operation, can be used in the protection and control of switching equipment in industry, mining, power generating plants and transformer stations.

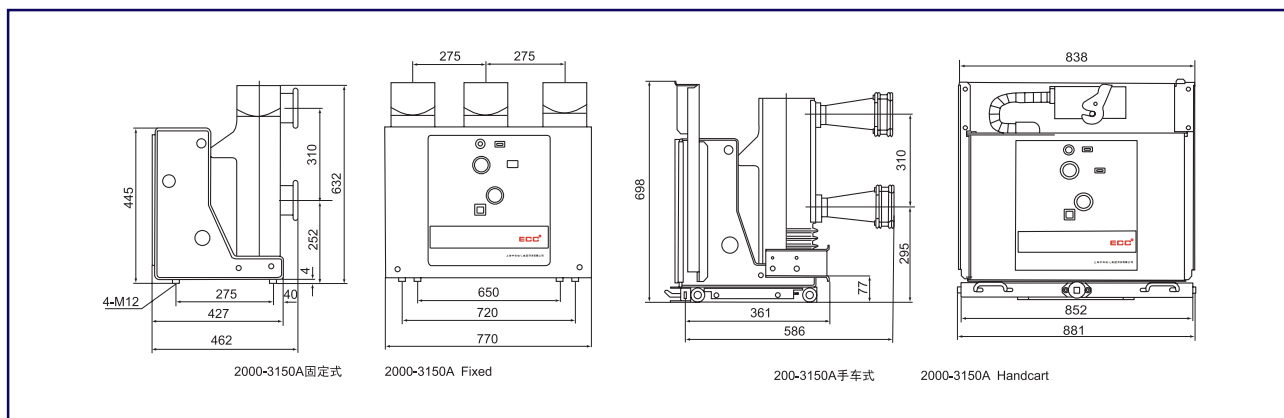
The modular spring operating mechanism is integrated with the circuit breaker and can be installed in a fixed housing cabinet or hand-pushed unit.

CHARACTERISTICS

Reliable mechanical and electrical interlocking systems ensure safe operation and maintenance. Intelligent control unit paves the way for future development in the design of circuit breakers. Simple operating mechanism ensures better structure and fewer components. All movable parts are protected with long-life grease and self-lubricated bearing and the surfaces are specially treated. The above features of VCB improve reliability of operation and results in a maintenance-free VCB. The product complies with GB1984/JB3855/DL402/DL403/IEC standards.

外形尺寸 Overall dimension:





断路器主要技术参数 Main technical parameter

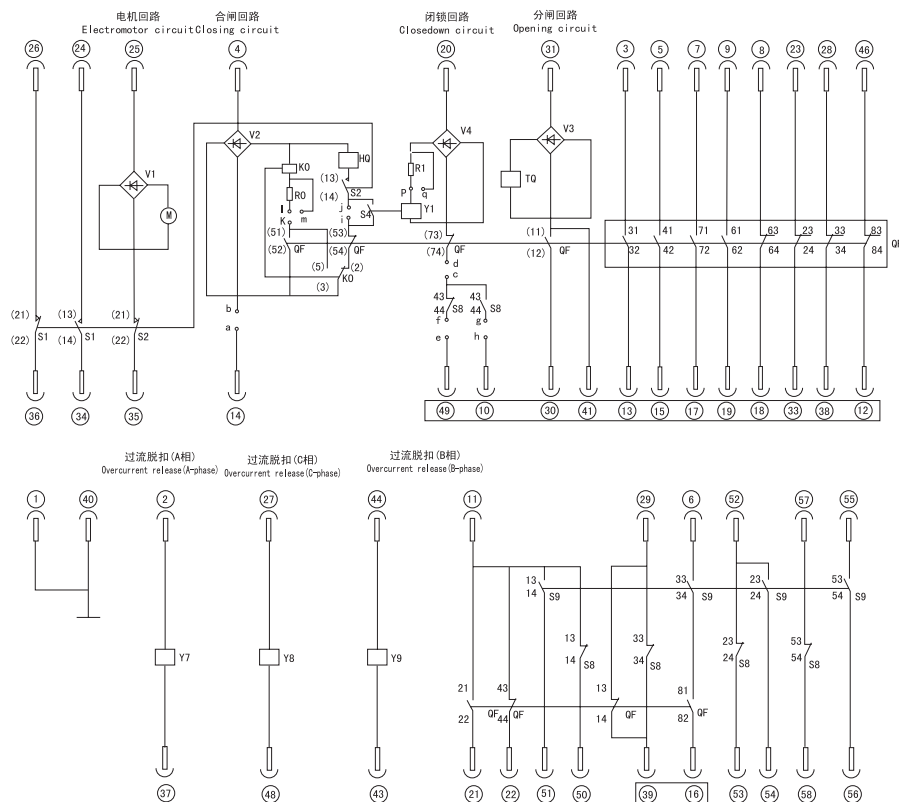
序号 No.	项目 Item	单位 Unit	数值 Parameter			
1	额定电压 Rated voltage	kV	12			
2	额定频率 Rated frequency	Hz	50			
3	额定雷电冲击耐受电压 (峰值) Rated lightning impulse withstand voltage	kV	75			
4	额定短时工频率耐受电压 (1min) 1min Rated power-frequency withstand voltage	kV	42			
5	额定短路开断电流 Rated short circuit interrupting current	kA	20	25	31.5	40
6	额定电流 Rated current	A	630, 1250, 1600, 2000, 2500 3150			
7	额定短时耐受电流 (有效值) Rated short-time withstand current	kA	20	25	31.5	40
8	额定峰值耐受电流 (峰值) Rated peak withstand current	kA	50	63	80	100
9	额定短路关合电流 (峰值) Rated short circuit closing current	kA	50	63	80	100
10	额定短路电流持续时间 Rated short circuit current duration	s	4			
11	机械寿命 Mechanical life	次	30000			
12	二次回路工频耐受电压 (1min) Secondary loop Power-frequency Withstand voltage	V	2000			
13	额定操作顺序 Rated operating sequence		O-t-CO-t-CO			

注(Annotate): 20kA、25kA、31.5kA、t=0.3s、t'=180s 40kA t=180s、t'=180s

断路器机械特性参数 Mechanical characteristic parameter

序号 No.	项目 Item	单位 Unit	数值 Parameter
1	触头开距 Clearance between open contacts	mm	9 ± 1
2	接触行程 Overtravel	mm	3.5 ± 0.5
3	触头合闸弹跳时间 Contact closing springing time	ms	≤ 2(40kA ≤ 3)
4	三相分、合闸不同期性 Three-phase opening or closing non-synchronism	ms	≤ 2
5	平均分闸速度 Average opening speed	m/s	0.9-1.2
6	平均合闸速度 Average closing speed	m/s	0.5-0.8
7	分闸时间(额定电压) Opening time(rated voltage)	ms	≤ 50
8	合闸时间(额定电压) Closing time(rated voltage)	ms	≤ 100
9	额定合、分闸操作电压 Rated voltage of energy-storage electromotor	V	AC110/220 DC110/220
10	储能电机额定电压 Rated voltage of energy-storage electromotor	V	AC110/220 DC110/220
11	储能电机额定功率 Rated power of energy-storage electromotor	W	90(40kA 100W)
12	储能时间 Energy-storage time	s	10
13	动、静触头累积允许磨损厚度 Accumulating permitted Wearing thickness of active and static contact	mm	3

图示: VS1⁺处于试验位置、分闸、未储能状态 VS1⁺ in state of test position and opening and energy-storage



可选件接线设置 (Connection setup): “/”表示断开, “✓”表示连接。

跳线状态 Connection state	跳线 Connection	a-b	c-d	e-f	g-h	a-f	a-g	b-c	I-j	I-k
带防跳 Anti-pumping	带闭锁 Closedown	✓	✓	✓	✓	/	/	/	/	✓
	无闭锁 No closedown	/	/	/	/	✓	✓	✓	✓	✓
无防跳 No anti-pumping	带闭锁 Closedown	✓	✓	✓	✓	/	/	/	/	/
	无闭锁 No closedown	/	/	/	/	✓	✓	✓	✓	/

S9: 辅助开关(当VS1⁺在工作位置时)
Auxiliary switch(VS1⁺ in state of service position)

S8: 辅助开关(当VS1⁺在试验位置时)
Auxiliary switch(VS1⁺ in state of test position)

S4: 闭锁电磁铁的辅助开关
Auxiliary switch of Closedown electromagnet

QF: 辅助开关 Auxiliary switch

HQ: 合闸线圈 Closing winding

TQ: 分闸线圈 Opening winding

R0-R1: 电阻 Resistance

S1-S2: 储能用微动开关 Energy-storage jiggle switch

a-m: 跳线端子 Terminal

M: 储能电机 Energy-storage electromotor

V1-V4: 整流器(直流时取消) Rectifier

K0: 机构内部防跳继电器(可选) Anti-pumping relay

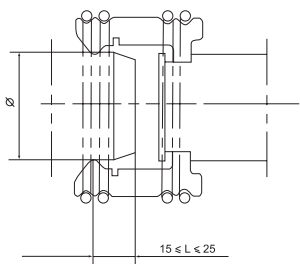
Y7-Y9: 间接式过电流脱扣器线圈(可选) Overcurrent release

Y1: 闭锁电磁铁(可选) Closedown electromagnet

VS1⁺ 型户内高压真空断路器主要型号规格:

The design of VS1⁺ series of vacuum circuit break(VCB) type and spec:

序号No.	额定电流(A) Rated current	额定短路开断电流(kA) Rated short circuit interrupting current	配合静触头尺寸(mm) Dimension of static contact	三相间距(mm) Three-phase space between
1	630	25	Φ 35	210
2	1250	25,31.5,40	Φ 49	210
3	1600	31.5	Φ 55	210
4	1600	40	Φ 79	275
5	2000	31.5,40	Φ 79	275
6	2500	31.5,40	Φ 109	275
7	3150	31.5,40	Φ 109	275



ZN65A-12

户内中压真空断路器

Low-Voltage Withdrawable Switchgear Cubicle



概述

ZN65A-12系列户内中压真空断路器是我公司根据我国电力行业的要求和国际上真空断路器技术发展趋势自行研制开发的新一代真空断路器。

ZN65A-12系列户内中压真空断路器负荷GB1984、DL403、IEC56等标准规定，并在国家中压电器质量监督检验中心和KEMA试验站通过了严格的型式试验。

产品技术特点

断路器采用整体式布局，按功能进行单元模块设计，这给断路器带来高质量，高可靠性和操作安全性，极大地减少维护量。

采用独特的变直传动机构真空灭弧室动触头，可减轻运动系统质量，降低合闸功，提高刚分速度，减少灭弧室触头烧损量。同时还可减小主回路水平向上的受力，三相主回路运动同期性好。

调整环节少，可进一步提高可靠性和减少维护量。可选配SIEMENS公司，无锡SIEMENS公司、美国西屋公司及国产真空灭弧室。

适配性好，可方便用于JYN3, KYN3, KYN18C, XGN2, 甚至于GG1A等多种柜型。

断路器储能机构结构简单，功能高度集成，可电动和手力储能。机构内充足含有特殊添加剂的长效润滑油。可靠性高，机械寿命长，维护量极少。

General

ZN65A -12 Indoor AC Medium Voltage Vacuum Circuit Breaker is a new generation of VCB developed by our company according to the requirements of our national electric power industry and developing trend in its international technical development.

ZN65-12 Indoor AC Medium Voltage Vacuum Circuit Breaker complies with GB1984, DL403 and IEC56 Standards and successfully passed the strict type tests both at China National Medium Voltage Apparatus Supervision and Inspection Center and overseas KEMA Laboratory in Netherlands.

Technical feature

Integral layout of the circuit breaker and unit module design as per its function makes the circuit breaker in high quality, high reliability and operation safety, resulting in greatly reduction of maintenance work.

The movable contact in vacuum interrupter driven by sole constructed driving mechanism will drop the quality of moving system, reduce operating power, increase instantaneous opening speed and lower the burning effect of the contact in the interrupter. Meanwhile, it makes less horizontal and upward force on main circuit and good condition in three phase movement discrepancy.

Less adjustment makes further reliability and reduces maintenance work a lot.

Various kinds of vacuum interrupters may be adopted such as that of Siemens, Wuxi Siemens, Westinghouse in USA and domestic made.

Good adaptability as suitably applied in various switchgears such as JYN3, KYN3, KYN18C, XGN2, even GG1A etc..

The energy charging mechanism is simple in structure and highly integrated in performance. It can be operated in both motor-driven and manual-operated modes. And further more, the mechanism is fully filled with long term efficient lubricant grease with particular additives. In a nutshell, it is highly reliable, long mechanical endurance and little maintenance work.

With high technical parameters shown in following table:

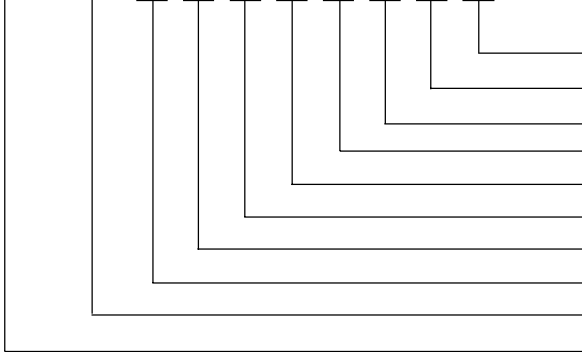
型号 Type	ZN65A-12/ T1250-25	ZN65A-12/ T1250-31.5	ZN65A-12/ T1250-40	ZN65A-12/ T1250-40	ZN65A-12/ T1250-63
机械寿命 / (次)	20000	20000	20000	20000	10000
断口工频耐压(kV)	48	48	48	48	42
断口雷电冲击耐压(kV)	85	85	85	85	75
额定短路开断电流开断次数 (次)	50	50	30	30	20
额定短路关合电流 (峰值) / (kA)	63	100(80)	130(100)	130(100)	160

注: 括号内参数为配SIEMENS公司、无锡SIEMENS公司、美国西屋公司真空灭弧室参数。

Note: The figures in parenthesis are for vacuum interrupters by Siemens, Wuxi Siemens and Westinghouse.

型号及含义 Type designation:

ZN65A-12-□□□□□□□□



- 真空灭弧室 Vacuum Arc chamber
- 有无特殊要求 Any special demand
- 储能电机电压 Power supply for energy storing motor
- 分闸控制电压 Control voltage for opening operation
- 合闸控制电压 Control voltage for closing operation
- 相间中心距 Central distance between phase wires
- 额定电流 Rated current
- 额定短路开断电流 Rated short circuit breaking current
- 额定电压 Rated voltage 12kV
- 型号 Type of VCB

主要技术参数 Main technical parameters

ZN65A-12户内交流中压真空断路器63KA及以下规格断路器整机参数

For ZN65A-12 Indoor AC Medium Voltage Vacuum Circuit Breaker with breaking current up to 63kA

序号	名称 Description		单位 Unit	ZN65A- 12/T20	ZN65A- 12/T25	ZN65A- 12/T31.5	ZN65A- 12/T40	ZN65A- 12/T63
1	额定电压		KV			12		
2	额定电流		A	630 1000 1250	1000 1250	1250 1600 2000 2500	1250 1600 2000 2500 3150	4000
3	额定	IMIN工频耐受电压	KV			42		
	绝缘水平	冲击耐受电压				75		
4	额定短路开断电流		KA	20	25	31.5	40	63
5	额定短路关合电流 (峰值)		KA	50	63	100(80)	130(100)	160
6	额定动稳定电流 (峰值)		KA	50	63	100(80)	130(100)	160
7	额定热稳定电流 (有效值)		KA	20	25	31.5	40	63
8	额定短路开断电流开断次数		次		50		30	20
9	额定热稳定时间		s			4		
10	额定操作顺序			O - 0.3s - CO - 180s - CO O - 180s - CO - 180s - CO				
11	机械寿命			20000			10000	
12	额定单个电容器组开断电流		A	630				
13	额定背靠背电容器组开断电流		A	400				
14	额定分闸时间		ms	45 ± 10				
15	最低操作电压分闸时间		ms	65 ± 10				
16	额定合闸时间		ms	50 ± 10			45 ± 10	

储能电机技术数据 For energy charging motor

型号 Type	额定电压 Rated voltage (V)	额定输出功率 Rated output power (W)	正常工作电压范围	额定电压下储能时间 (s)
HDZ-12060B	DC110, AC220	200	85% ~ 110%额定电压	≤ 15
HDZ-22060B	DC220, AC220	200	85% ~ 110%额定电压	≤ 15

序号 No.	额定参数 Description		参数值 Reference value	
1	额定电压			
2	额定绝缘、 水平(相间 对地、断口)	1min 工频耐受电压 (有效值)相间、对地、	相间、对地、	42
		kV	断口	50
		雷电冲击耐受电压 (峰值)	相间、对地、	75
		kV	断口	85
3	辅助回路1min工频耐受电压	V	2000	
4	额定频率	Hz	50	
5	额定电流	A	4000	
6	额定短时耐受电流	kA	63	
7	额定峰值耐受电流	kA	176	
8	额定短时持续时间	S	4	
9	额定短路开断电流	kA	63	
10	额定短路开断电流的直流分量		≥63%	
11	额定短路关合电流 (峰值)	kA	176	
12	额定操作顺序		合分-180s-合分	
13	额定失步开断电流	kA	31.5	
14	额定负荷开、合次数	次	100	
15	系统源预期瞬态恢复电压规定值		峰值电压 kV	22
			参考时间 μs	4.9
			上升 $kV/\mu s$	4.5
16	合闸时间	ms	55 ± 10	
17	分闸时间	ms	45 ± 10	
18	合闸弹跳时间	ms	≤ 2	
19	三相合、分闸不同期性	ms	≤ 2	
20	合-分时间	ms	100	
21	额定开断时间	ms	≤ 70	
22	机械寿命	次	10000	
23	动静触头允许磨损累计厚度	mm	3	

分合闸线圈技术参数

	合闸线圈 Open coil	分闸线圈 Trip coil
额定操作电压 (V)	DC220; DC110 AC220; AC110	DC220; DC110 AC220; AC110
20℃时线圈直流电阻	247 57.7	247 57.7
正常工作电压范围	85%-110%额定电压	65%-120%额定电压

使用环境条件

Working conditions

- * 周围空气温度
上限 +40℃，下限 -10℃
- * 海拔高度
产品使用在 12KV 系统中，海拔高度不超过 1000m
产品使用在 7.2KV 系统中，海拔高度可提高到 3000m
- * 空气相对湿度
日平均值不大于 95%，月平均值不大于 90%
- * Ambient temperature:
Ranging from -10℃ to + 40℃;
- * Altitude above sea level:
Not over 1000 meters if it is used in 12kV systems and not over 3000 meters in 7.2kV systems.
- * Relative humidity:
Daily average not exceeding 95% and monthly average not over 90%

- * 饱和蒸气压
日平均值不大于 2.2×10^{-3} Mpa
月平均值不大于 1.8×10^{-3} Mpa
- * 安装地点应无经常性的剧烈震动
- * 周围空气应不受腐蚀性或可燃性气体，水蒸汽的明显污染；安装场所应保持干燥。

- * Saturate vapor pressure:
Daily average $\leq 2.2 \times 10^{-3}$ MPa
Monthly average $\leq 1.8 \times 10^{-3}$ MPa
- * The installation site should be no frequent severe shock
- * The ambient air is not subjected to the obvious pollution from corrosive and inflammable gaseous, nor from vapor. Keep dry of the installation venues.

Overall dimensions

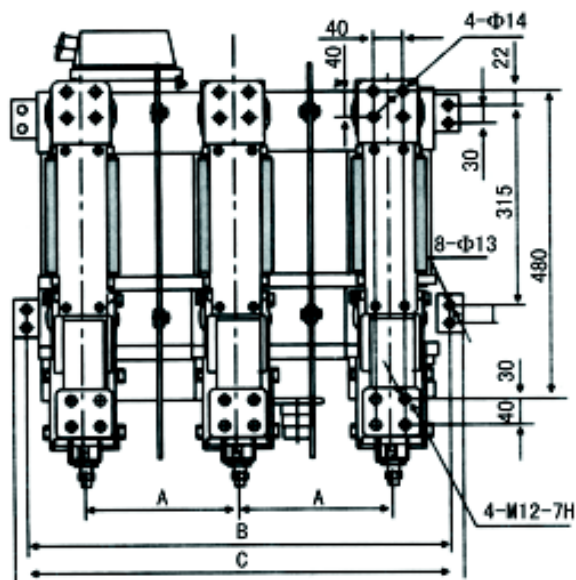


图1-1

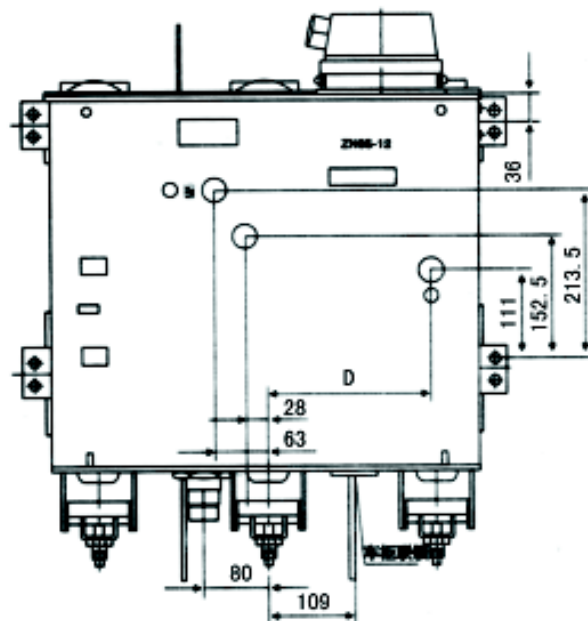


图1-2

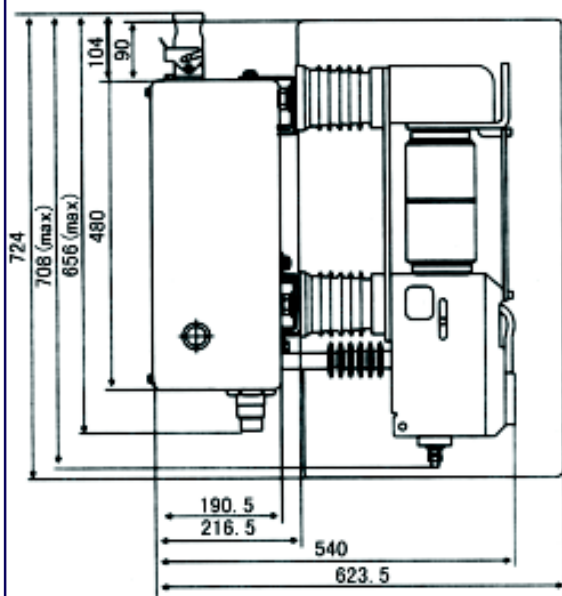


图1-3

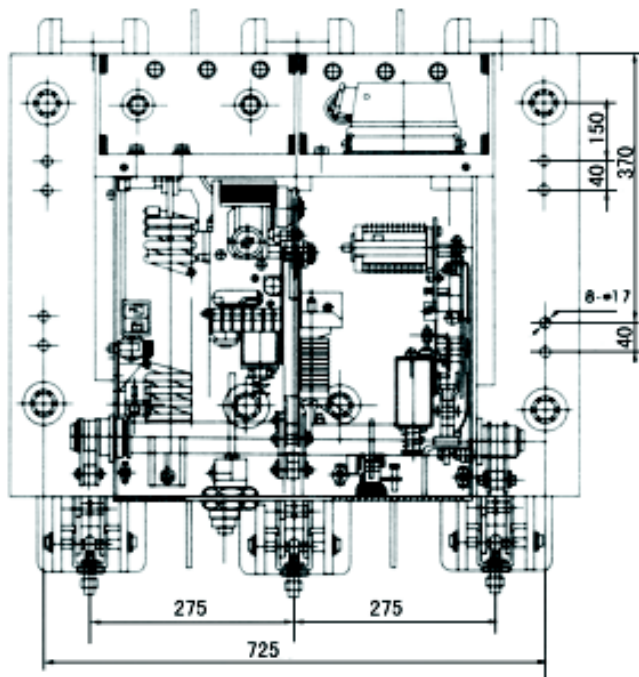


图2

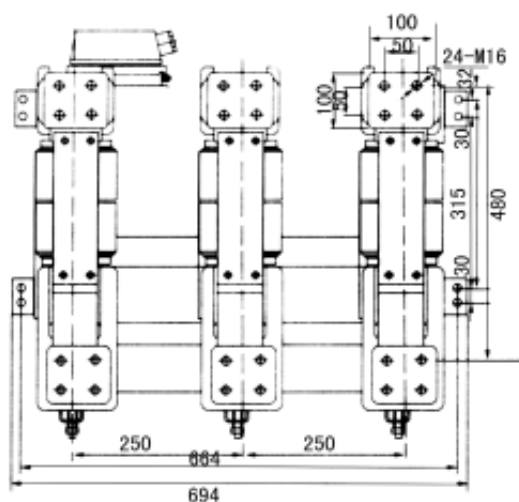


图3-1

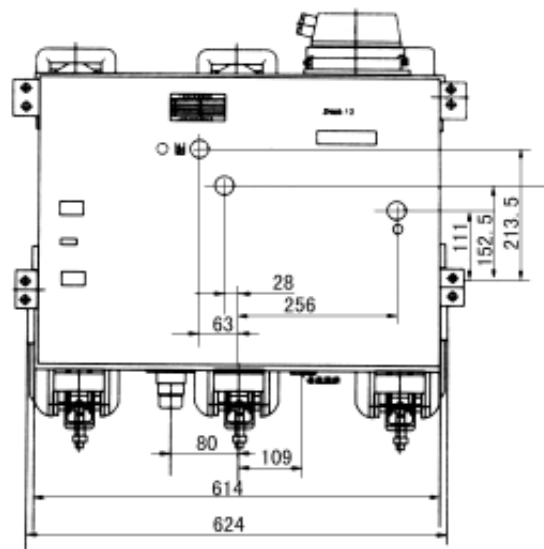


图3-2

图1 Dimensions for 12kV/630A,1000A,1250A/20kA,25kA 31.5kA and 40K circuit breakers.规格断路器外形尺寸

图2 Dimensions for 12kV/630A,1000A,1250A/20kA,25kA 31.5kA and 40K circuit breakers.规格断路器外形尺寸

图3 Dimensions for 12kV/1600A,2000A,2500A , 3150A / 31.5kA and 40K circuit breakers.规格断路器外形尺寸

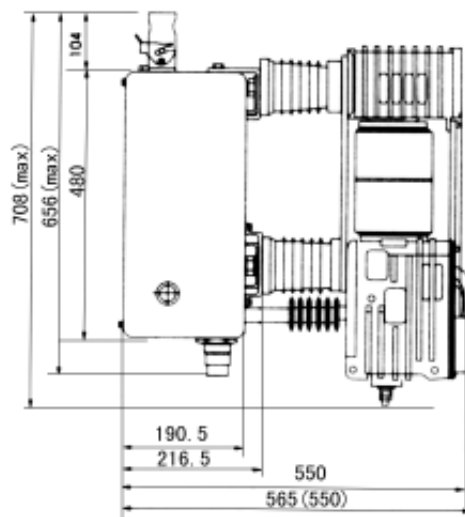
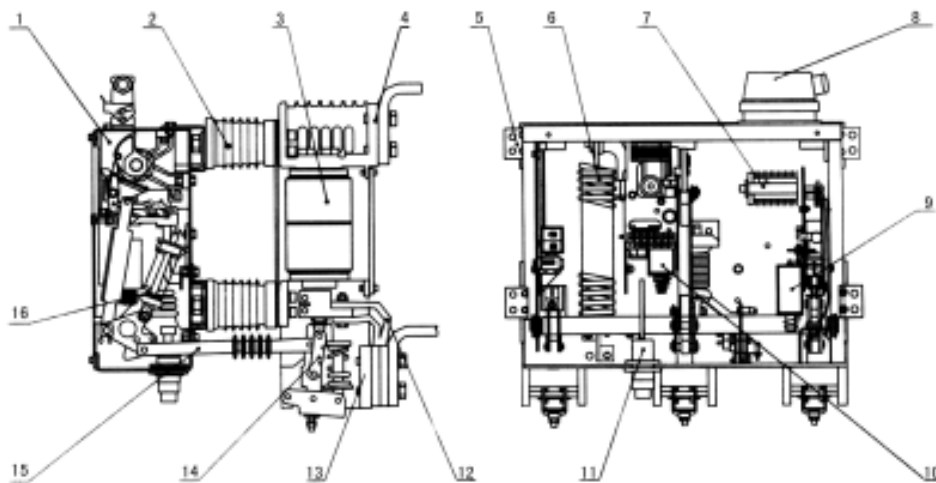


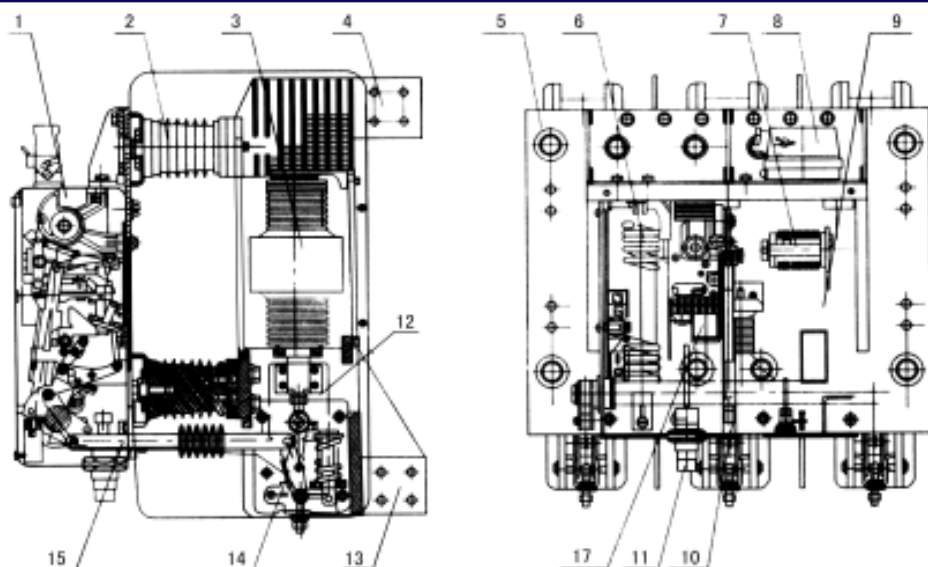
图3-3

A	B	C	D	备注
210	584	614	216	有相间隔板
250	664	694	256	仅适用1250A规格断路器且无相间隔板

产品结构总布置 Structure and general layout



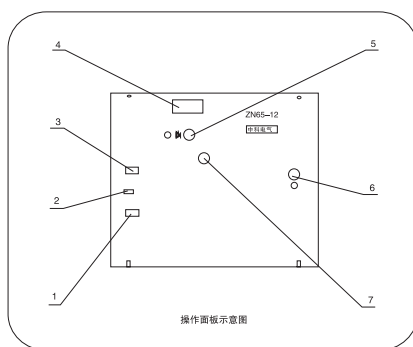
Structural drawing for ZN65A-12 Indoor Medium Voltage Vacuum Circuit Breaker up to 40kA



Structural drawing for 63kA ZN65A-12 Indoor Medium Voltage Vacuum Circuit Breaker

- | | | | | |
|--------------------|-------------------------|--------------------|------------------------------|-------------------------|
| 1. Mechanism box | 2. Insulator | 3. Arc chamber | 4. Upper terminal | 5. Installation plate |
| 6. Closing spring | 7. Aux. switch | 8. Secondary plug | 9. Opening solenoid | 10. Closing solenoid |
| 11. Oil bump | 12. Flexible connection | 13. Lower terminal | 14. Linear driving mechanism | 15. Insulating push rod |
| 16. Opening spring | 17. Closing solenoid | | | |
| 1 机构箱体 | 2 绝缘子 | 3 灭弧室 | 4 上出线端 | 5 安装挂板 |
| 6 合闸弹簧 | 7 辅助开关 | 8 二次插头 | 9 分闸电磁铁 | 10 合闸电磁铁 |
| 11 油缓冲 | 12 软连接 | 13 下出线端 | 14 变直传动机构 | 15 绝缘推杆 |
| 16 分闸弹簧 | 17 合闸电磁铁 | | | |

操作面板 Operating panel



1 合分指示 2 计数器 3 储能指示 4 产品铭牌
5 手动能操作孔 6 手动分闸按钮 7 手动合闸按钮

1. 合分指示 ON/OFF indication
2. 计数器 Counter
3. 储能指示 Energy stored indication
4. 产品铭牌 Nameplate
5. 手动能操作孔 Hand operating hole
6. 手动分闸按钮 Manual operated opening pushbutton
7. 手动合闸按钮 Manual operated closing pushbutton

* 断路器的操动机构和主回路分别布置在断路器的前后两面。断路器的弹簧储能式操动机构布置在断路器的前半部。操动机构设计成清晰的，独立布置的四个功能单元，即合闸功能单元、分闸功能单元、传动功能单元和辅助功能单元。断路器的主回路布置在后半部。真空灭弧室通过高绝缘性能的支撑绝缘子支撑在断路器的基架上，上下垂直布置，灭弧室的固定端朝上，动端朝下。操动机构和灭弧室之间的传动连接布置在断路器的下部。主回路的下部设置有独特的动导电杆变直机构，通过这个变直机构把操动机构输

* The operating mechanism and primary circuit are laid out in the front and at the rear of the circuit breaker respectively. The operating mechanism is obviously designed and independently configured into four functional units, i.e., closing functional unit, opening functional unit, driving functional unit, and auxiliary functional unit. The vacuum arc chamber is situated on the support of the circuit breaker via highly insulating performance insulators vertically laid out, up and down. The fixed terminal of the arc chamber is faced up whereas the movable terminal of it is faced down. The driving links between operating mechanism and the arc chamber is arranged in the lower part of the circuit

出给灭弧室的机械运动变成沿着灭弧室的机械运动变成沿着灭弧室动导电杆轴线方向的上下直线运动。

* 储能合闸功能单元

合闸功能单元的主体是一个机构箱。机构箱的输入部分是储能电机和手力储能轴的轴端，电机或手力驱动能够使得断路器的合闸弹簧拉伸储能。机构箱的输出部分是驱动凸轮，当断路器的合闸电磁铁执行合闸指令时，电磁铁的动铁芯将使得储能弹簧的保持机构解体；当手动合闸操作时，手动推杆也将使得储能弹簧的保持机构解体，由储能弹簧带动驱动凸轮进行合闸操作。

* 分闸功能单元

分闸功能单元的主体是一个合闸保持机构。合闸保持机构的一端与断路器的传动主轴发生关系，通过这一关系实现断路器合闸状态的有效保持。合闸保持机构的另一端是一个脱扣机构，当断路器的分闸电磁铁执行分闸指令时，这具脱扣机构能够在分闸电磁铁铁芯的驱动下可靠地使得合闸保持机构解体，完成断路器的分闸操作。合闸保持机构的脱扣机构还可以接受手力驱动，实现断路器的手动分闸。

* 传动功能单元

传动功能单元是断路器连接机构和灭弧室的传动部分，主要包括传动主轴、分闸弹簧、分闸缓冲器等结构件。传动功能单元负责把断路器操动机构的驱动输出传递灭弧室的动导电杆，并且实现规定的机械特性参数。

维护

由于真空断路器具有结构简单和耐用的特点因此有很长的使用寿命。在整个使用期间，断路器操动机构的维修工作量极少，真空灭弧室免维护。维护仅包括：经常性的检查；定期进行清扫绝缘件、导电件表面；润滑（蜗轮箱内无须润滑）。

订货须知

用户在订货时应注明：

- * 真空断路器的型号、参数及订货数量
- * 断路器额定电压，额定电流及额定短路开断电流
- * 选择控制回路原理图及额定操作电压
- * 真空灭弧室外壳材料
- * 相间距离
- * 有无半绝缘罩

breaker. In the lower part of the primary circuit, there is a unique device to transmit movement into linear mode from various others. This device changes the mechanical movement from the operating mechanism to the arc chamber into an upward and downward linear movement along the axial direction of a movable conductive rod in the arc chamber.

* Closing functional unit

The major part of the unit is a mechanism box. The input part of the mechanism box is also the shaft end of motor-driven and manual-operated energy charging links. Both motor-driven and manual-operated modes make the closing spring tensioned and thus energy charged. The output part of the mechanism box is actually a driving cam. When the closing solenoid of the circuit breaker is actuated by a closing command, the movable core of the solenoid disables the maintaining device of the energy storing spring; when in manual operating, the manual pushing rod disables the maintaining device of the energy storing spring, and then the energy stored spring drives a cam to complete closing operation.

* Opening functional unit

The major part of the unit is a closing status maintaining device one end of which is related to driving main shaft of the circuit breaker. Through this relation, the closing status of the circuit breaker is efficiently maintained. The other end of the maintaining device is a trip mechanism. When the opening solenoid is actuated by an opening command, the trip mechanism disables the closing maintaining device reliably and completes the opening operation of the circuit breaker consequently. This device also can be driven by hand to bring the manual opening operation of the circuit breaker into realization.

* Driving functional unit

The driving functional unit refers to the driving part between the link mechanism and the arc chamber, mainly composed of structural parts such as driving main shaft, opening spring, opening bumper. This unit is responsible for transmission of driving output from operating mechanism to the arc chamber with specified mechanical characteristic parameters.

Maintenance

Featuring simple in structure and long term endurance, actually, the vacuum circuit breaker has a very long application life. During the whole application period, very little maintenance needed for operating mechanism and free maintenance for vacuum arc chamber. The maintenance work includes regular inspection, regular clean insulating parts and conductive surfaces and lubrication. No lubrication needed inside worm wheel box.

Information given when ordering

When ordering, customers are supposed to note the following:

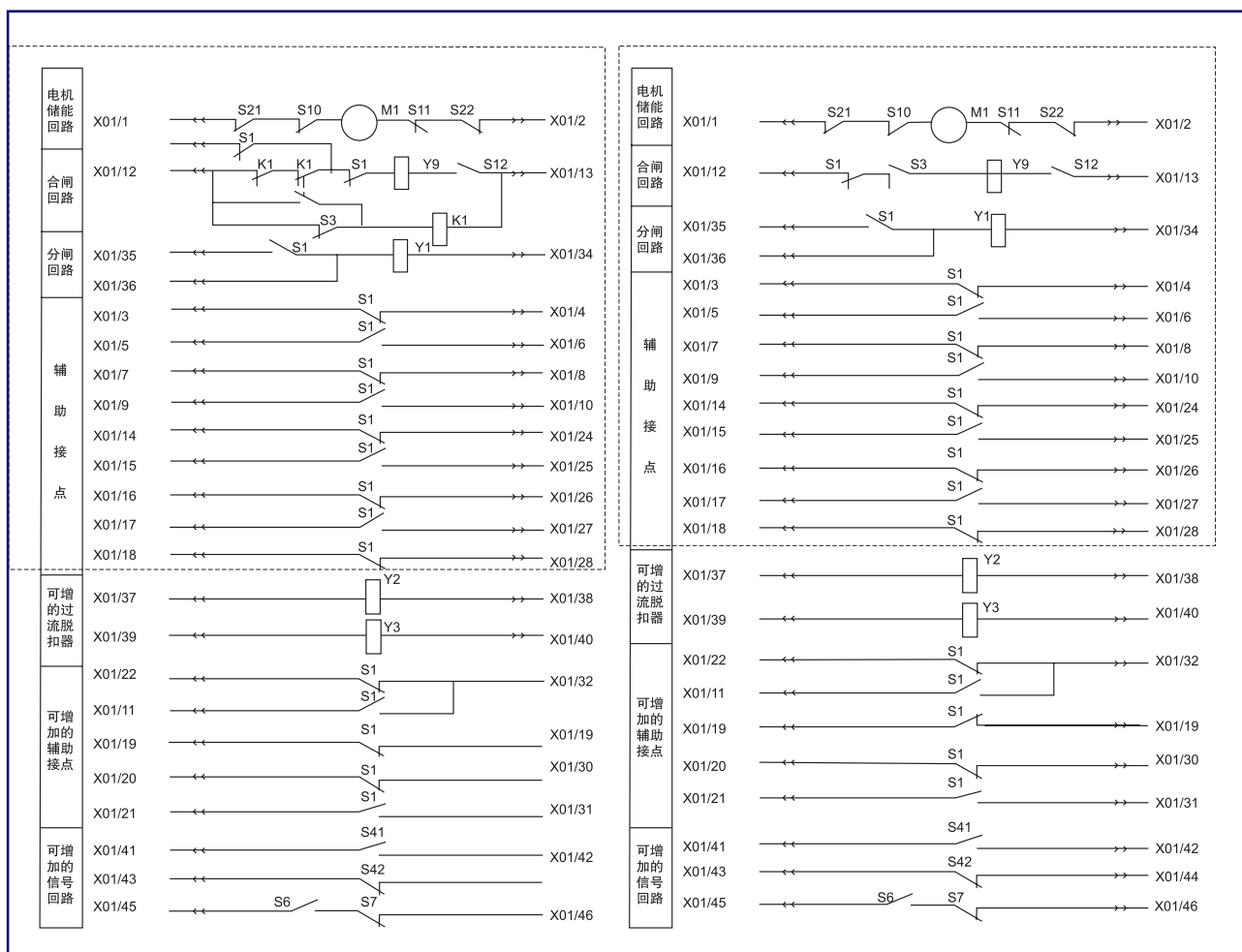
- * Type, parameter and ordering quantity of the vacuum circuit breaker
- * Rated voltage, rated current and rated short circuit breaking current

- * 备品、备件的名称及数量
- * 用户若有其它特殊要求，可以订货时说明

注：产品如有更新，恕不另行通知。

- * Selection of schematic drawing of control circuit and rated operating voltage
- * Enclosure material of vacuum arc chamber
- * Distance between poles
- * Whether there is half insulating cover or not?
- * Name and quantity of spare parts
- * Any particular requirements of customer may be discussed with the manufacturer for solution.

Note: The product is subjected to change without prior notice



序号 No.	符号 Symbol	名称 Description
1	M	储能电机
2	Y9	合闸电磁铁
3	Y1	分闸电磁铁
4	Y1, Y3	过渡脱扣电磁铁
5	S1	辅助开关
6-11	S3, S21, S22, S41	与储能联动的微动开关
12	S6	与分闸联动的微动开关
13	S7	与手动分闸联动的微动开关
14-15	S10, S11	与手动合闸联动的微动开关
16	X01	二次插头插座(HARTIN 46 芯)
17	K1	防跳继电器
18	S12	与联锁联动的微动开关

ZN28K-12

户内中压真空断路器

Low-Voltage Withdrawable Switchgear Cubicle



概述

- * ZN28K-12户内真空断路器是ECC推出的具有九十年代国际同类产品水平的12KV系列真空断路器。
- * 完整的产品参数系列：额定电流从630A到4000A，额定短路开断电流从20KA到50KA，可满足用户的各种需要。
- * 完整的产品型式试验：额定短路关合电流（峰值）、额定动稳定、满容量开断时的直流分量值等指标远远高出国家标准的规格。
- * 先进的小型化铜铬触头纵磁场灭弧室：灭弧室技术参数高，满容量累计开断次数多，截流水平低。
- * 方便灵活的结构形式和安装方式：用户可根据自己的需要选择瓷壳、陶壳两种灭弧室中的任一种，而且同规格的两种灭弧室可以互换；操动机构可选择配装CD17电磁操动机构或CT19弹簧操动机构。
- * 有保障的高可行性和稳定性：按照可靠性原理，全部产品在出厂前全部进行磨合老练，消除早期可能性出现的故障。
- * 产品系列性、通用性好，用户维护使用简单方便。整体框架支撑结构，具有定位精度高、运行可靠性高、体积小、重量轻等特点。即可单独固定安装，又可方便装配成手车，有较广泛的适应性。

使用环境

- * 周围空气温度：
上限+40℃，下限-10℃
- * 海拔高度不大于1000m
- * 相对湿度：
日平均值不大于95%，月平均值不大于90%
- * 饱和蒸汽压：
日平均值不大于 2.2×10^{-3} Mpa
月平均值不大于 1.8×10^{-3} Mpa
- * 周围空气应不受腐蚀性或可燃气体，水蒸汽等明显污染。

General

- * ZN28K-12 Indoor Vacuum Circuit Breaker is a kind of 12kV series vacuum circuit breaker with 1990's international advanced level of its kind turned out by ECC.
- * Complete series products: Rated current from 630A to 4000A and rated short circuit breaking current from 20kA to 50kA satisfies requirements of various customers.
- * Complete type tests performed: The parameters of rated short circuit making current (peak value), rated short time and peak value with stand current and DC component of breaking current at full capacity are much better than those specified in relevant national standard.
- * Advanced and compact arc chamber with copper-chromium contact longitudinal magnetic field: Actually, the arc chamber is high in technical parameters, more accumulated breaking operations at full capacity and low in current chopping level.
- * Easy and flexible construction form and installation mode: Customers have options to select one of the glass enclosure and porcelain enclosure arc chambers as per needs and still more, the two kinds of the arc chamber with same specifications are interchangeable. As for operating mechanisms, customers may select CD17 Electromagnetic Operating Mechanism or CT19 Spring Operating Mechanism.
- * Guaranteed feasibility and high stability: According to the principle of reliability, all products have gone through aging effect before delivery in order to avoid premature faults.
- * Excellent series and general purpose orientation makes simple and easy in operation and maintenance.
- * Excellent service are offered to our customers.
- * The integral frame supporting structure adopted instead of welded truck type features higher positioning accuracy, higher operational reliability, compact, light. As a result, it may be individually and fixedly installed as well as assembled into a truck just as easily, hence widely adaptability.

Working conditions

- * Ambient temperature: -10℃ ~ +40℃
- * Altitude above sea level: Not higher than 1000 meters
- * Relative humidity: Daily average $\leq 95\%$, monthly average $\leq 90\%$
- * Saturate vapor pressure: Daily average $\leq 2.2 \times 10^{-3}$ MPa

- * 无经常性的剧烈振动
- * 如使用超过上述规定，用户与制造商协商确定

monthly average $\leq 1.8 \times 10^{-3}$ Mpa.

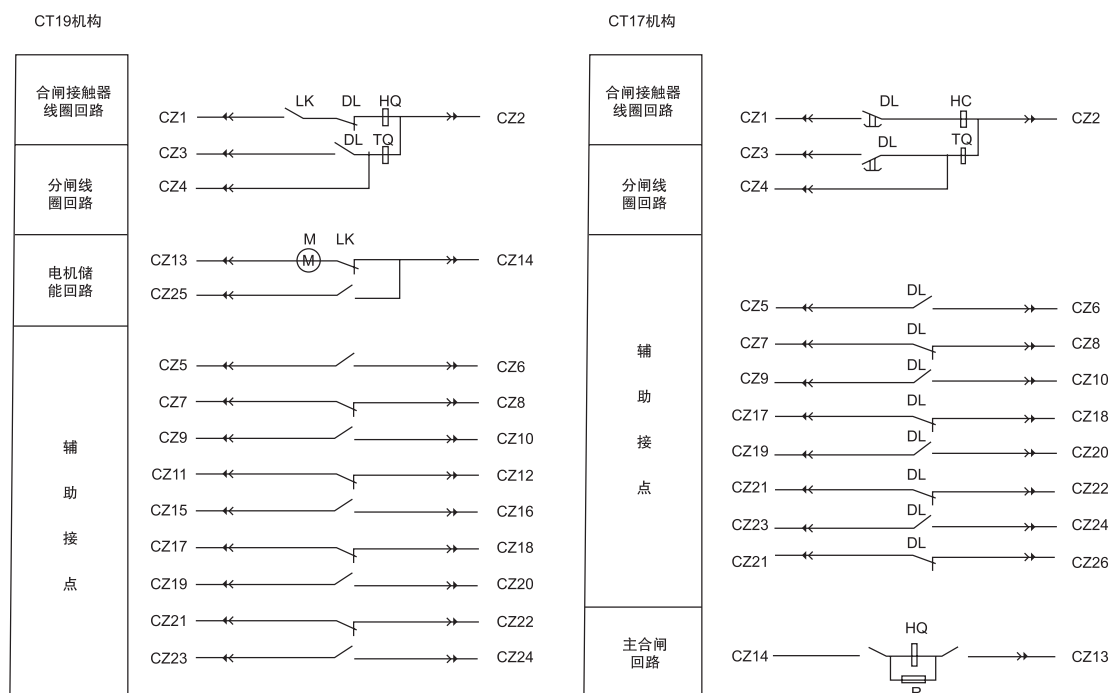
- * Ambient air not exposed to obvious pollution due to corrosive, in flammable gaseous and vapor
- * No frequently severe shock.
- * If actual working conditions are rougher than the above mentioned, solution may be settled down through discussion with manufacturer.

主要技术参数 Main technical parameters

序号	名称 Description		单位 Unit	型号				
				ZN28K-12-20	ZN28K-12-25	ZN28K-12-32	ZN28K-12-40	ZN28K-12-50
1	额定电压		kV	12				
2	额定电流		A	630 1000 1250	1000 1250	1000 1250 2000	1250 1600 2000 2500 3150	4000
3	1min 工频耐压	相间相地	kV	42				
		断口		48				
4	雷电冲击 耐压	相相地	kV	75				
		断口		84				
5	额定短路开断电流		kA	20	25	31.5	40	50
6	额定短路开断电流开断次数		次	50	50	50	40	50
7	直流分量百分数					45%	45%	45%
8	额定动稳定电流（峰值）		kA	50	63	100	130	130
9	4S热稳定电流		kA	20	25	31.5	40	50
10	额定操作顺序			★	★	★	☆	☆
11	额定失步开断电流		kA			8	10	12.5
12	额定异相接地故障开断电流		kA	17.3	21.7	27.3	34.6	43.3
13	额定单个电容器组开断电流		A	630				
14	额定背对背电容器组开断电流		A	400				

★ O-0.3s-CO-180s-CO ☆ O-180s-CO-180s-CO

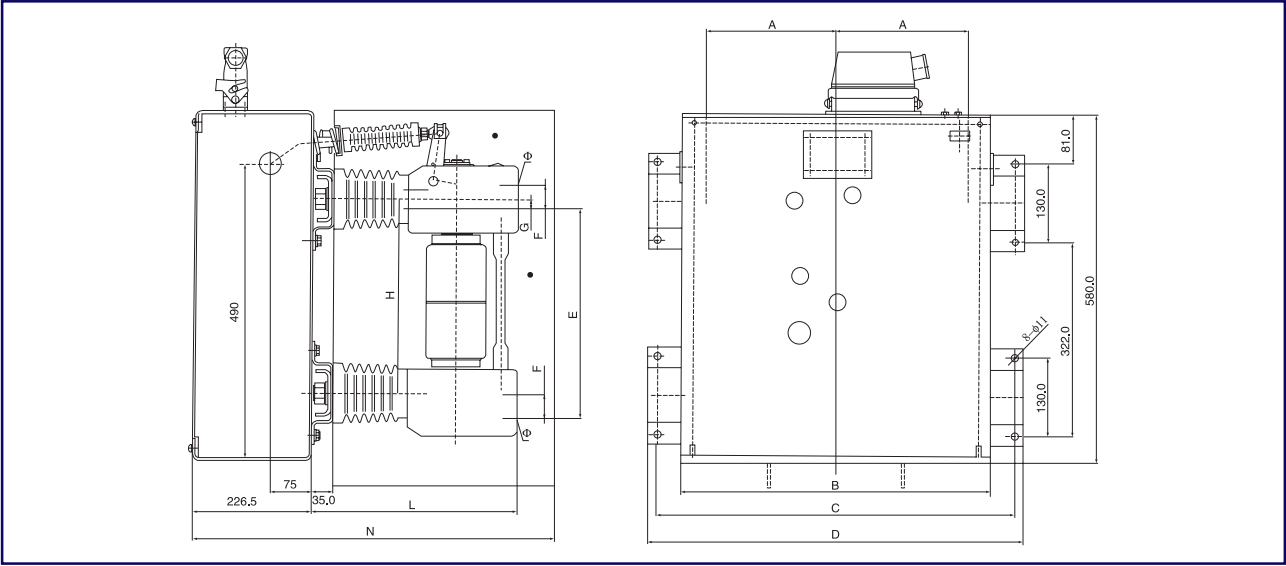
控制原理图及参数 Schematic drawing for control with parameters concerned



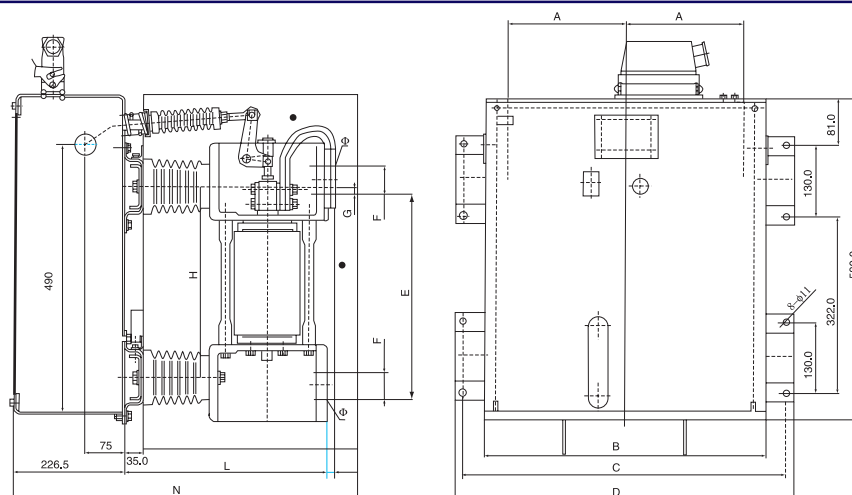
				单位 Unit	25kA	31.5kA	40kA	50kA
CD17电磁 操动机构	合闸线圈	电阻	~ 110V	Ω	1	0.5	0.96	0.67
			~ 220V		4	2	1.9	1.34
		功率	~ 110V	W	12100	24200	25500	36080
			~ 220V					
		电流	~ 110V	A	110	220	232	328
			~ 220V		55	110	116	164
	合闸接触器型号				CZO-40C/CZY1-40C			
	分闸线圈	电阻	~ 110V	Ω	43			
			~ 220V		166			
		功率	~ 110V	W	282			
			~ 220V		293			
		电流	~ 110V	A	2.56			
			~ 220V		1.33			
	合闸时间			ms	≤ 120			
	分闸时间			ms	≤ 55			
CD19电磁 弹簧操动 机构	储能电机	功率		W	70	70	120	120
		额定电流		A	0.7/1.5	0.7/1.5	1.2	1.2
		储能时间		s	< 10	< 10	< 12	< 12
	合、分闸线	电阻	~ 110V	Ω	37			
			~ 220V		82			
			~ 110V		3.2			
			~ 220V		14.1			
		功率	~ 110V	W	327			
			~ 220V		590			
			~ 110V		1100			
			~ 220V		1100			
		电流	~ 110V	A	2.97			
			~ 220V		2.68			
			~ 110V		10			
			~ 220V		5			

外形及安装尺寸 Overalls and installation dimensions

* CT19 机构

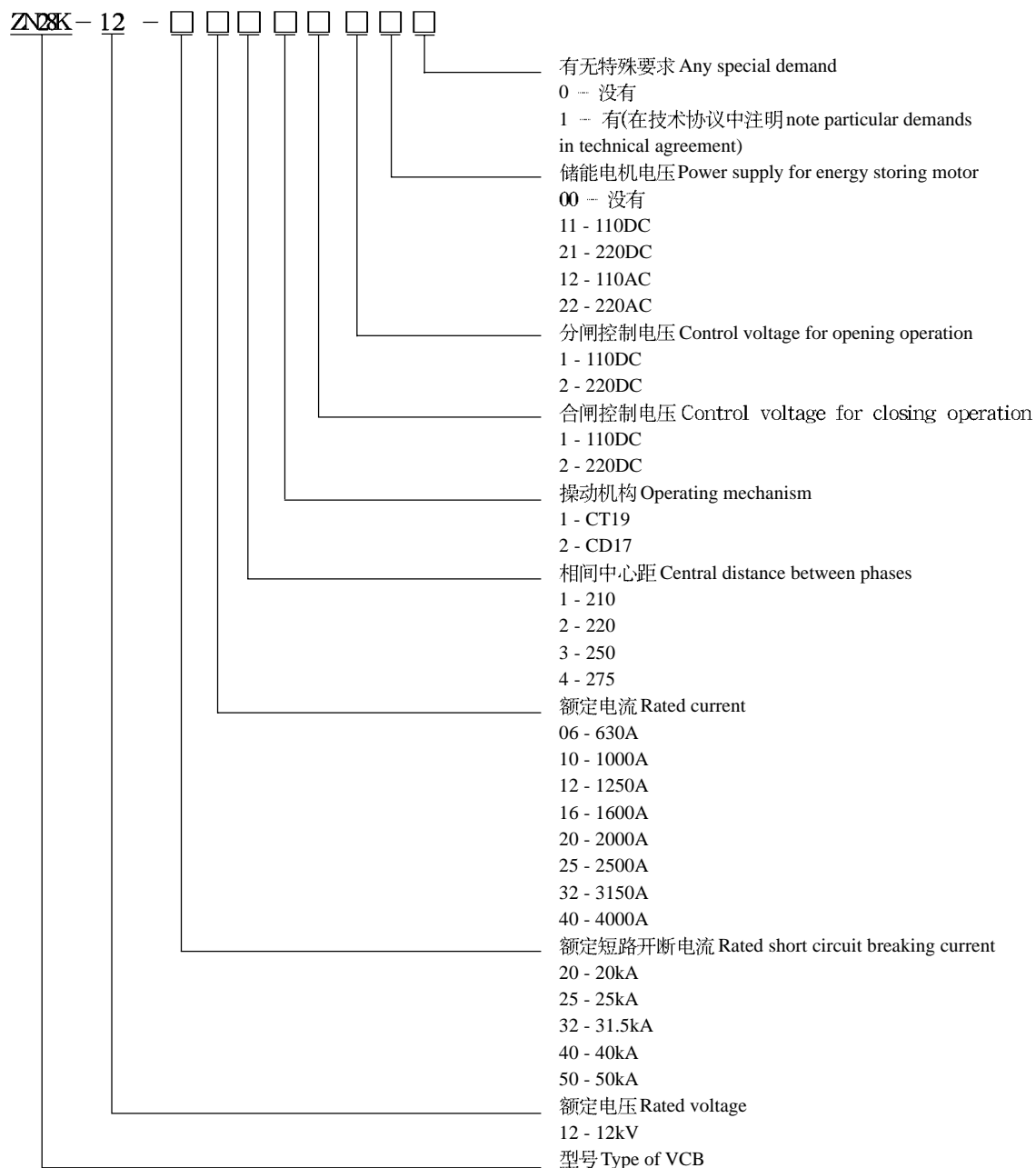


* CT17 机构



Overalls and installation dimensions for independent ZN28K - 12 in mm

型号 Type	A	B	C	D	E	F	G	H	L	M	N	
ZN28K-12-2006	210	520	602	632	347	40 × 40	15	322	345	631		4- φ 13
	220	520	602	632	347	40 × 40	15	322	345			
ZN28K-12-2010	210	520	602	632	347	40 × 40	15	322	345			
	220	520	602	632	347	40 × 40	15	322	345			
ZN28K-12-2012	210	520	602	632	347	40 × 40	15	322	345			
	220	520	602	632	347	40 × 40	15	322	345			
	250	580	660	700	347	40 × 40	15	322	345			
	275	630	680	720	347	40 × 40	15	322	345			
ZN28K-12-2510	210	520	602	632	347	40 × 40	15	322	345			
	220	520	602	632	347	40 × 40	15	322	345			
ZN28K-12-2512	210	520	602	632	347	40 × 40	15	322	345			
	220	520	602	632	347	40 × 40	15	322	345			
	250	580	660	700	347	40 × 40	15	322	345			
	275	630	680	720	347	40 × 40	15	322	345			
ZN28K-12-3212	210	520	602	632	347	40 × 40	15	322	345			
	220	520	602	632	347	40 × 40	15	322	345			
	250	580	660	700	347	40 × 40	15	322	345			
	275	630	680	720	347	40 × 40	15	322	345			
ZN28K-12-3220	250	580	660	700	347	50 × 50	25	322	345			上出线4-M 12-深14下出线 4- φ 13
	275	630	680	720	347	50 × 50	25	322	345			
ZN28K-12-4012	250	580	660	700	347	50 × 50	25	322	345			
	275	630	680	720	347	50 × 50	25	322	345			
ZN28K-12-4016	250	580	660	700	347	50 × 50	25	322	345			
	275	630	680	720	347	50 × 50	25	322	345			
ZN28K-12-4020	250	580	660	700	347	50 × 50	25	322	345			
	275	630	680	720	347	50 × 50	25	322	345			
ZN28K-12-4025	250	580	660	700	347	50 × 50	25	322	345			
	275	630	680	720	347	50 × 50	25	322	345			
ZN28K-12-4032	250	580	660	700	373	50 × 50	12	347	380	15	661	上出线4-M 12-深15下出线 4- φ 13
	275	630	680	720	373	50 × 50	12	347	380			
ZN28K-12-5040	250	580	660	700	373	50 × 50	12	347	380			
	275	630	680	720	373	50 × 50	12	347	380			



订货时按如下项目注明规格型号:

- * 产品名称及全型号
- * 操动机构（电磁或弹簧）
- * 二次接线方案
- * 操作电源种类及工作电压

Note the specification and type with the following items:

- * The name and full type of the product
- * Operating mechanism (electromagnetic or spring operated)
- * Secondary wiring scheme
- * Category of operational power supply and operation voltage

ZN28A-12

户内中压真空断路器

Low-Voltage Withdrawable Switchgear Cubicle



概述

ZN28A-12A系列户内交流中压真空断路器系三相交流 50Hz, 额定电压 2KV 的户内交流中压电器设备, 主要用于固定式开关设备中, 或替换老式开关设备中的少油断路器, 亦可装在移开式开关设备内使用。在供工矿企业、发电厂、变电站 (所), 该产品做为电气设备的保护与控制元件, 并适用于频繁操作的场所。

本产品符合GB1984《交流高压断路器》、JB3855《3.6-40.5KV 户内高压真空断路器》标准及DL/T403《12-40.5KV 户内高压真空断路器订货技术条件》要求。

型号及含义

Z	真空断路器 Vacuum circuit breaker
N	户内 Indoor
28A	设计序号 Design serial number
—	
12	额定电压 Rated voltage (KV)
/	
□	额定电流 Rated current (A)
—	
□	额定短路开断电流 Rated short circuit breaking current (KA)

使用环境条件

环境温度:	-10°C ~ +40°C (允许在 -30°C 时储运)
相对湿度:	日平均相对湿度: ≤ 95% 月平均相对湿度: ≤ 90% 日平均饱和蒸汽压: ≤ 2.2Kpa 月平均饱和蒸汽压: ≤ 1.8Kpa
海拔高度:	不超过 2000m (2500m 为高原型)

General

As a kind of three phase AC 50Hz indoor medium voltage electrical apparatus with rated voltage 12kV, ZN28A - 12 Series Indoor AC Medium Voltage Vacuum Circuit Breaker is mainly used in fixed type switchgears and withdrawout switchgears or supersedes less oil content circuit breaker in old switchgears. It is widely used in industrial and mineral enterprises, power plants and substations as a kind of protective and control component for various electrical apparatus.

The circuit breaker complies with various standards such as GB1984 "AC High Voltage Circuit Breaker", JB3855 "3.6 - 40.5kV Indoor AC High Voltage Vacuum Circuit Breaker" and DL/T403 "Ordering Technical Conditions on 12 - 40.5kV Indoor AC High Voltage Vacuum Circuit Breaker".

Working conditions

Ambient temperature:	-10°C ~ +40°C (permissible -30°C for storage and transportation)
Relative humidity:	Daily average ≤ 95%, monthly average ≤ 90%;
Saturate vapor pressure:	Daily average ≤ 2.2×10^{-3} MPa, monthly average ≤ 1.8×10^{-3} Mpa.
Altitude above sea level:	

地震烈度：不超过 8 度
无火灾、爆炸危险、严重污秽、化学腐蚀及剧烈振动的场所。

Not higher than 2000 meters (plateau type:2500m)
Earthquake intensity:
Not over Force 8
No conflagration, no risk of explosion, no sever pollution, nor chemical corrosion, places where there is no violent shock.

主要技术参数 Technical parameters

序号	名称 Description	单位 Unit	数据 Value		
			ZN28A-12/630、1000、1250-20	ZN28A-12/630、1250、1600-25	ZN28A-12/1250 1600、2000-31.5
1	额定电压	kV	12	12	12
2	额定电流	A	630、1000、1250	630、1000、1250	630、1000、1250
3	额定短路开断电流	kA	20	25	31.5
4	额定短路关合电流（峰值）	kA	50	63	80
5	额定耐受电流（峰值）	kA	50	63	80
6	额定短时耐受电流	kV	20	25	31.5
7	额定短路持续时间	S	4	4	4
8	额定短路开断电流开断次	次	50	50	50
9	额定操作顺序	分-0.3-合分-180s-合分			
10	1min工频耐压（有效值）	kV	42	42	42
11	雷电冲击耐压	kV	75	75	75
12	机械寿命	次	1000	1000	1000
13	触头开距	mm	11 ± 1	11 ± 1	11 ± 1
14	接触行程	mm	4 ± 1	4 ± 1	4 ± 1
15	三相分合闸同期性	ms	≤ 2	≤ 2	≤ 2
16	合闸触头弹跳时间	ms	≤ 2	≤ 2	≤ 2
17	极间中心距	mm	250 ± 5	250 ± 5	250 ± 5
18	平均分闸速度（接触油缓冲器前）	m/s	0.7-1.3	0.7-1.3	0.7-1.3
19	平均合闸速度	m/s	0.4-0.8	0.4-0.8	0.4-0.8
20	动静触头累计允许磨损厚度	mm	3	3	3

产品结构和工作原理

本产品自身不带操动机构，使用时必须配用合适的操动机构。
本产品装设中封式纵磁场真粉灭弧室，主轴、分闸弹簧油缓冲溶液等部件安装在框架中，机架的后有安装孔，供断路器安装固定用。机架前面水平装设六个大爬距绝缘子，上绝缘子固定静支架，下绝缘子固定动支架，动静支架的前部兼作进出线端子，真空灭弧室装设在动静支架之间，主轴通过绝缘拉杆、拐臂与真空灭弧室动导电杆连接，动静支架之间还装有大爬距绝缘杆，将两者连接一体，提高了整体刚度。

工作原理

真空断路器配用中封式纵磁场真空灭弧室。当动、静触头在操动机构作用下带电分闸时，触头间隙将燃烧真空电弧，并在电流过零时熄灭电弧，由于触头的特

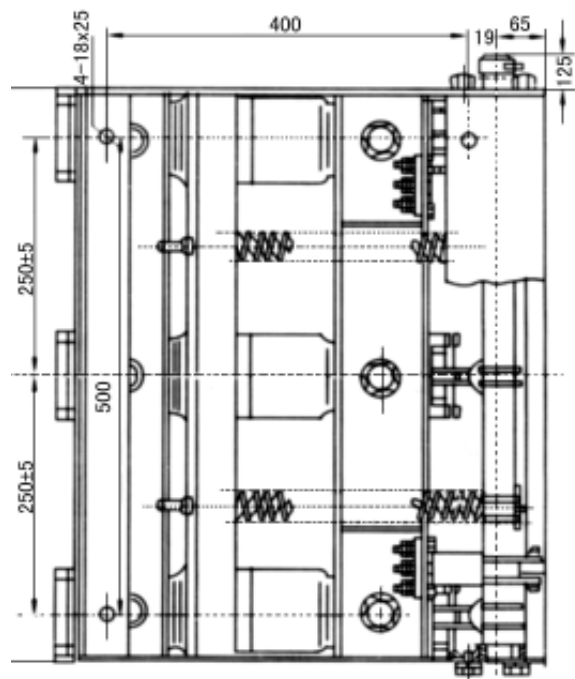
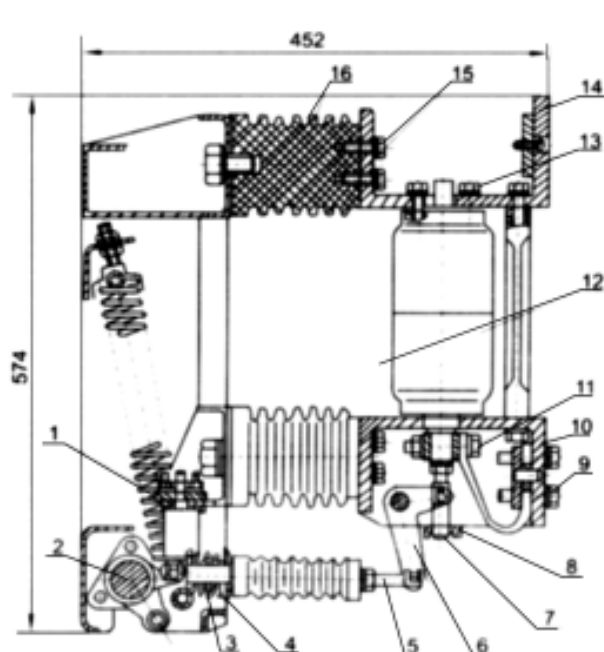
Structure and working principle

As a bare product, the circuit breaker has not an operating mechanism with itself, so customers are supposed to equip an appropriate operating mechanism when operation.
There are central-sealed longitudinal magnetic field vacuum interrupter, main shaft, opening spring, damping oil placed on the frame. At the rear of the frame, there are fixation holes for fixation of the circuit breaker. In the front of the frame, six big creepage distance insulators are mounted horizontally. The upper insulators are used to fix the holder for fixed contacts whereas the lower insulators are used to fix the holder for movable contacts. The front of the holders for movable and fixed contacts are used as incoming and outgoing terminals also.

Working principle

The vacuum circuit breaker works with a central-sealed longitudinal magnetic field vacuum interrupter. When movable and fixed contacts are electrically separated from closed status, a vacuum arc will burn in the clearance between separated contacts and be extinguished when cur-

产品结构尺寸图 Overall dimension



1、开距调整片观
The clearance regulating piece
5、接触行程调整螺栓
Contact travel regulating screw
9、螺栓
Screw
13、真空灭弧室紧固螺栓
Conductive tight bolt

2、主轴
Main shaft
6、拐臂
Toggle
10、动触头支架
Holder for movable contact
14、静触头支架
Holder for fixed contact

3、触头压力弹簧
Compressed spring for contact
7、导杆
Guiding rod
11、导电夹紧螺栓
Conductive clamping bolt
15、绝缘子固定螺栓
Conductive tight bolt

4、弹簧座
Spring holder
8、导向板
Direction guiding plate
12、真空灭弧室
Vacuum interrupter
16、绝缘子
Insulator

殊结构，燃弧期间触头间隙会产生适当的纵向磁场，这个磁场可使电弧均匀分布于触头表面，维持低的电弧电压，并使真空灭弧室具有较高的弧后介质强度恢复速度，小的电弧能量和小的电腐蚀速率，从而提高了断路器开断短路电流的能力和电寿命。

订货须知

- * 用户在订货时应注明
- * 真空断路器的型号、参数及订货数量
- * 备品、配件的名称及数量
- * 所配操动机构名称、型号
- * 特殊使用条件

rent passes zero. Due to particular shape structure of the contact, an appropriate longitudinal magnetic field is generated in the contact clearance during arcing time, which makes arc uniformly distributed on the surface of contact, maintains low arc voltage and helps vacuum interrupter gaining higher recovery speed in post-arc dielectric strength. Besides, the longitudinal magnetic field reduces arc energy, drop electric corrosive rate on contacts, enhance breaking short circuit current capacity and elongate electrical endurance.

Information for ordering

- * Customers are supposed to note the following when ordering
- * Type, parameters and ordering quantity of the vacuum circuit breaker
- * Name and type of its operating mechanism
- * Name and quantity of spare parts and accessories
- * Particular working conditions

ZN85-40.5(3AV3) 型户内中压真空断路器

Low-Voltage Withdrawable Switchgear Cubicle



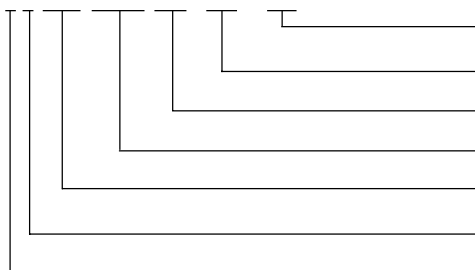
概述

ZN85-40.5(3AV3)型户内交流中压真空断路器(以下简称“断路器”)适用于三相交流50Hz,35KV的电力系统中,可供工矿企业,发电厂及变电站等作为保护和控制设备之用,并适用于频繁操作的场合。

本产品符合国家标准GB1984《交流高压断路器》、JB3855《3.6-40.5KV户内交流高压真空断路器》等标准的规定。

型号及含义

ZN85-40.5/T-□-□



General

ZN85 - 40.5 (3AV3) Series Indoor AC Medium Voltage Vacuum Circuit Breaker is competently used in three-phase 50Hz 35kV electric power systems in industrial and mineral enterprises, power plants and substations as a kind of protective and control component for various electrical apparatus, and suitably used for frequent operation.

The circuit breaker meets the requirements specified in various standards such as GB1984 “AC High Voltage Circuit Breaker” and JB3855 “3.6 - 40.5kV Indoor AC High Voltage Vacuum Circuit Breaker”.

额定短路开关电流 Rated short circuit breaking current (KV)
额定电流 Rated current (A)
操作机构代号 Code for operating mechanism
额定电压 Rated voltage (KV)
设计序号 Design serial number
户内 Indoor
真空断路器 Vacuum circuit breaker

使用环境条件

- * 环境温度:
-25℃~+40℃;日平均温度不超过35℃
- * 相对湿度:
日平均值不大于95%
月平均值不大于90%
水蒸气日平均值不大于2.2KPA
水蒸气月平均值不大于1.8KPA
- * 海拔高度:
1000m及以下。
- * 无尘埃、烟、腐蚀性和/或可燃性气体、蒸汽或盐雾的污染及剧烈振动
- * 辅助电路中感应的电磁干扰的幅值,不超过1.6KV

Working conditions

- * Ambient temperature:
-25℃~+40℃ with daily average not over 35℃;
- * Relative humidity:
Daily average ≤95%,
monthly average ≤90%;
Daily average ≤2.2 × 10⁻³ MPa,
monthly average ≤1.8 × 10⁻³ MPa;
- * Altitude above sea level:
Not higher than 1000 meters;
- * No dust, no smoke, nor corrosive and /or inflammable gaseous, nor vapor, salt fog, nor violent shock;
- * The amplitude value of electromagnetic interference inducted in auxiliary circuit: Not exceeding 1.6mV.

结构特点

* 断路器采用一体化和模块化设计，整体结构简单合理，采用上下布置，灭弧室部分在上面，联锁和操作部分在下面。使用专用的弹簧操动机构，无需调整，动作稳定可靠。

* 三相导电回路的真空灭弧室布置在封闭的绝缘筒内。其绝缘筒采用机电性能可靠的环氧树脂材料并用成熟的真空浇注工艺而成。这样不仅使用相间绝缘性能显著提高，而且使每相回路不受外界恶劣环境的影响，可以防止灰尘和异物进入主回路的部分，缩小了断路器的整体尺寸。

* 断路器采用美国Cutler-hammmar公司生产的WL-35855X 真空灭弧室或采用国内最新设计的线圈式纵向强磁场结构真空灭弧。它采用陶瓷外壳，铜铬触头材料，具有外形尺寸小，绝缘水平高，灭弧能力强，电寿命长及优良的开断和关合短路电流的性能。

Structural features

* The integration and modularization design makes the whole structure simple and reasonable. Upward and downward configuration is adopted with interrupter situated at top, and interlocking and operating device located in down part. A special spring operating mechanism without regulation makes stable and reliable operation.

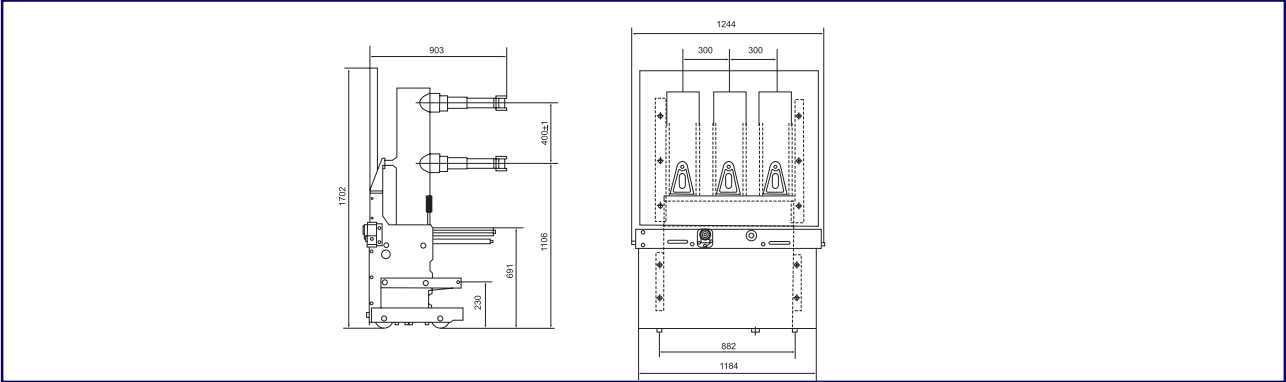
* The vacuum interrupter of three-phase conductive circuits are laid out in an enclosed insulating column made of reliable epoxy resin in terms of electrical performance from qualified injection processing. At this, the insulating performance between phases is remarkably boosted, each of phase is free from adverse impact of environmental situations, preventing of the primary circuit against intruding of dust and foreign objects, and resulting in compact volume of the circuit breaker.

* The circuit breaker is equipped with WL-35855X Vacuum Interrupter imported from Cutler-Hammer in USA or domestically newly-designed vacuum interrupter with coil type longitudinal intense magnetic field structure. With porcelain enclosure and Cu-Cr contact material, these vacuum interrupters feature compact in overall dimensions, high in insulating level, excellent in arc quenching, long electrical endurance and exceptional performance in breaking and making short circuit current.

主要技术参数 Main technical parameters

序号	名称 Description		单位 Unit	数据 Value	
1	额定电压		KV	40.5	
2	额定绝缘水平	1min工频耐压（有效值）	KV	95	
		额定雷电冲击耐压（有效值）	KV	185	
3	额定电流		A	1250	1600
4	额定频率		Hz	50	
5	额定短时耐受电流		KV	25	31.5
6	额定峰值耐受电流		KV	63	80
7	额定短路开断电流		KV	25	31.5
8	额定短路关合电流（峰值）		KV	63	80
9	额定短路持续时间		S	4	
10	额定操作顺序			分-0.3-合分-180s-合分 *	
11	开断时间		ms	<80	
12	额定短路持续时间		次	20	
13	额定电容器组开断电流		A	630	
14	机械寿命		次	1000	
15	额定操作电压		V	-100/-110, -220-/220	

外形及安装尺寸 Overall and installing dimensions



FZW13(A)-12/T630

型户外中压真空断路器

Low-Voltage Withdrawable Switchgear Cubicle



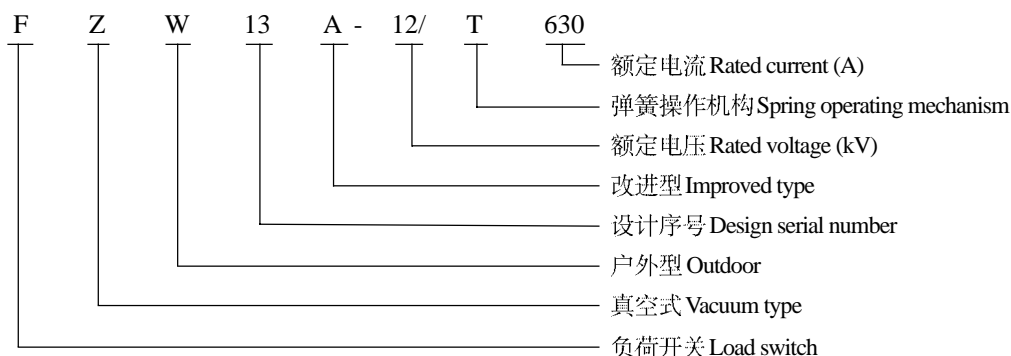
概述

FZW13(A)-12/T630型户外中压真空负荷开关(以下简称负荷开关)主要用于交流50Hz,额定电压12KV的网络中作为分断,关合负荷电流之用,还能分断变压器空载电流和电容器组的电容电流。

主要特点

该负荷开关采用真空灭弧室灭弧,因此具有优良的开断和关合短路电流能力,并配有手动弹簧操作机构。适宜和于频繁操作场所,它还具有操作简单,动作可靠,体积小,重量轻,免维护等特点。还可根据用户的需要配装避雷器或隔离开关(即负荷开关与隔离开关组合,简称“组合开关”)。

型号意义



使用环境条件

- * 周围空气温度: 上限 +40℃, 下限—30℃
- * 海拔: ≤1000m (若需增高海拔, 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: 无经常性剧烈震动
- * 污秽等级: III级
- * 最大日温差: 不超过25℃

General

FZW13(A)12/T630 Outdoor Medium Voltage Vacuum Load Switch is mainly used in AC 50Hz 12kV power systems for switching on and off load current, and breaking no load current of transformers and capacitive current of capacitor bank also.

Main characteristics

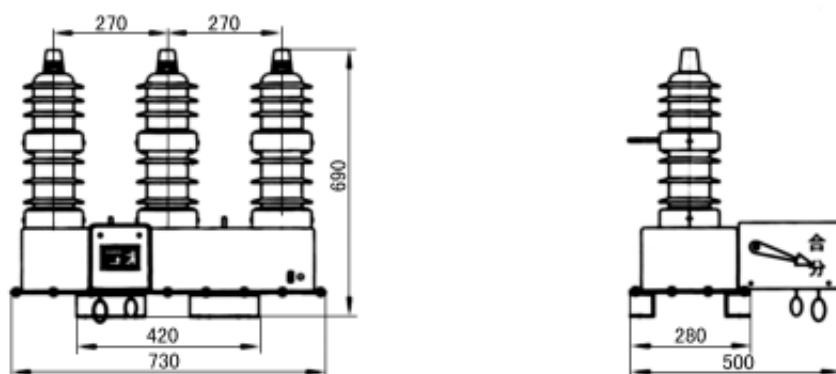
With a vacuum interrupter, this kind of load switch possesses excellent breaking and making current capacity. Equipped with manual operated spring operating mechanism, it is suitable to work in frequent operating situations, featuring simple and reliable in operation, compact, light and maintenance free. It also may be equipped with surge arrester and disconnector just as per requirements of customers. If the load switch is combined with other required apparatus such as disconnector, we call it combined switch in short form.

Working conditions

- * Ambient temperature: -30℃ ~ +40℃;
- * Altitude above sea level: ≤1000 meters; if it is working in higher altitude, insulating level should be upgraded accordingly
- * Wind pressure: Not over 700 Pa, corresponding to wind speed of 34m/s
- * The amplitude: No frequent violent shock
- * Pollution level: III
- * Maximum daily temperature difference: ≥25℃.

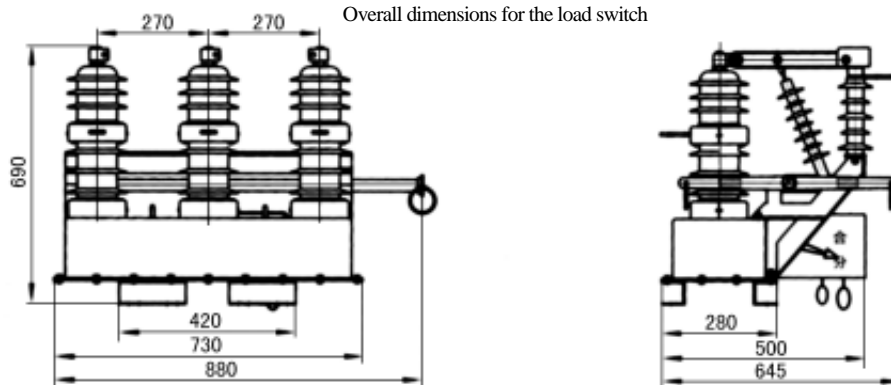
序号	名称 Description			单位 Unit	数据 Value
1	额定电压			KV	12
2	额定绝缘水平	1min工频耐压	干试		42
			湿试		34
		雷电剖面耐压（峰值）			75
3	额定频率			Hz	50
4	额定电流			A	630
5	额定闭环开断电流				630
6	额定有功负载开断电流				630
7	额定电缆充电开断电流				10
8	额定短时耐受电流			kA	20
9	额定峰值耐受电流				50
10	额定短路关合电流				50
11	额定短路持续时间			s	4
12	额定开断空载变压器容量			kVA	1250
13	机械寿命			次	10000
14	额定操作顺序				CO

外形及安装尺寸图（FZW13 — 12/T630 型） Overall and installing dimensions



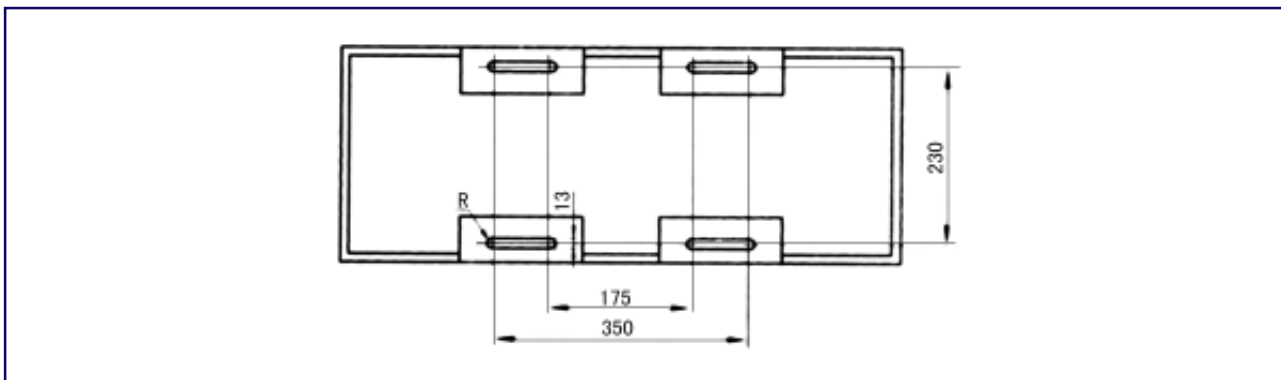
负荷开关外形尺寸图

Overall dimensions for the load switch

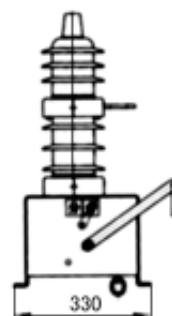
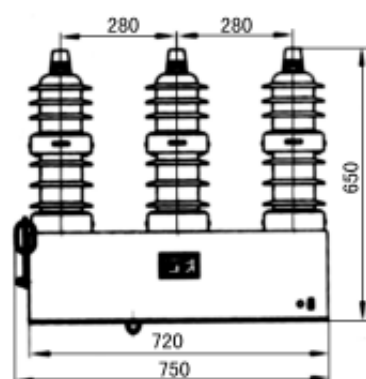


组合开关外形尺寸图

Overall dimensions for the combined switch

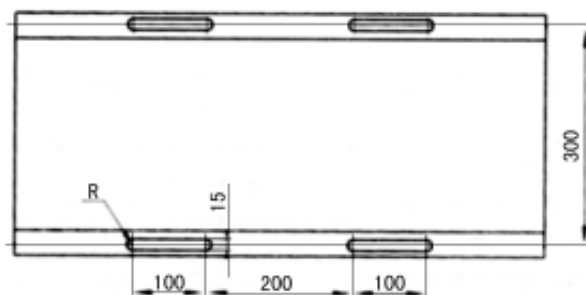
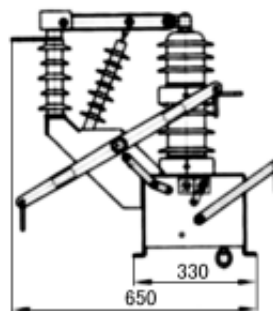
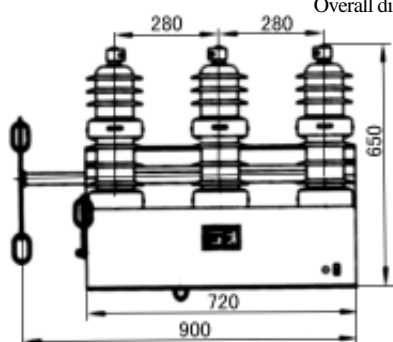


外形及安装尺寸图 (FZW13A - 12/T630 型) Overall and installing dimensions



负荷开关外形尺寸图

Overall dimensions for the load switch



负荷开关及组合开关安装尺寸图

Installing dimensions for the load switch and combined switch

ZW8-12

型户外中压真空断路器

Low-Voltage Withdrawable Switchgear Cubicle



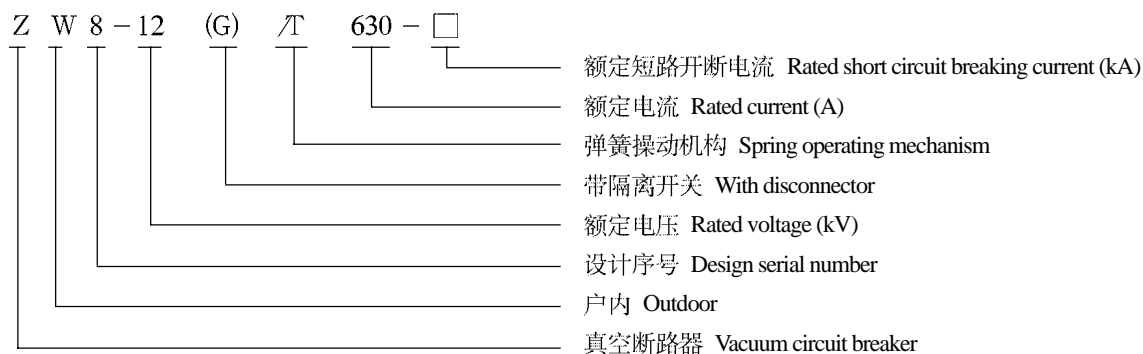
概述

ZW8-12系列户外交流中压真空断路器系三相开关设备, 主要用于10KV农网和城网的电力系统, 作为分, 合负荷电流, 过载电流及短路电流之用, 也可用于其它类似场所。

General

As a three-phase AC 50Hz outdoor medium voltage switching device, ZW8 - 12 Series Outdoor AC Medium Voltage Vacuum Circuit Breaker is mainly used in 10kV urban and rural electric power systems for switching on and off load current, breaking and making overload current and short circuit current or for other similar purposes.

型号及含义



使用环境条件

- * 环境温度: $-30^{\circ}\text{C} \sim +40^{\circ}\text{C}$
- * 海拔高度: 2000m 及以下
- * 风压: 不超过 700Pa (相当于风速 34m/s)
- * 无经常性剧烈振动

Working conditions

- * Ambient temperature: $-30^{\circ}\text{C} \sim +40^{\circ}\text{C}$
- * Altitude above sea level: ≤ 2000 meters
- * Wind pressure: Not over 700 Pa, corresponding to wind speed of 34m/s
- * Places where there is no frequent violent shock.

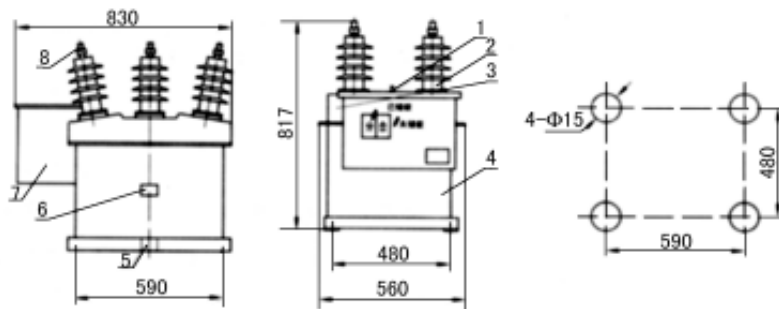
结构特点

* 断路器结构

该产品由操动机构、导电回路、绝缘系统、密封件及壳体组成, 整体结构为三相共箱式, 导电回路是由出现导电杆、动静端导电板、导电夹与真空灭弧室连接而成; 外绝缘主要是通过中压套来实现的, 具有抗污秽能力, 内绝缘为空气及环氧树脂复合绝缘; 所配操动机构为弹簧储能操动机构; 该断路器还可以带隔离开关。

Structure

As a three-phase-in-one-tank type apparatus as a whole, this product is composed of operating mechanism, conductive circuit, insulating system, sealing parts and enclosure. The conductive circuit may be divided into incoming and outgoing conductive rods, movable and fixed conductive plate, conductive clamp and vacuum interrupter. External insulation is mainly realized by medium voltage bushings with anti-pollution capacity whereas internal insulation is of air and epoxy resin synthetic one. The circuit breaker is equipped with a spring charged operating mechanism. This circuit breaker may be equipped with a disconnector if required.



ZW8-12系列户外交流中压真空断路器外形尺寸及安装尺寸

1、吊环 2、套管 3、箱盖 4、箱体 5、吸湿器 6、铭牌 7、操动机构 8、导电杆
1. Lifting hook 2. Bushing 3. Case cover 4. Tank 5. Moisture absorber 6. Name plate 7. Operating mechanism 8. Conductive rod

序号	名称 Description		单位 Unit	数据 Value
1	额定电压		KV	12
2	额定电流		A	630
3	工频耐压 (1min)		KV	42
4	雷电冲击耐压 (峰值)		KV	75
5	额定短路开断电流		KV	12.5 、 16、 20
6	额定短路关合电流 (峰值)		KV	31.5、 40、 50
7	额定 (峰值) 耐受电流		KV	31.5、 40、 50
8	4s 额定短时耐受电流		KV	12.5、 16、 20
9	额定操作顺序			分 -- 0.3S -- 合分 -- 180S -- 合分
10	额定短路开断电流开断次数		次	30
11	机械寿命		次	10000
12	储能电机额定电压		V	DC或AC220、110
13	额定操作电压 (配专用弹簧操动机构)	分闸线圈	V	DC或AC220,DC110
		分闸线圈		
14	过流脱扣器额定电流		A	5
15	动静触头允许磨损厚度		mm	3
16	质量		kg	230
17	极间中心距离		mm	175 ± 2 (箱内)、260 ± 5 (箱外)

订货须知

用户在订货时应注明：

- * 断路器的型号、名称、主要技术参数及订货数量
- * 是否带隔离开关，电流互感器保护和测量用地数量，变化
- * 操动机构电压
- * 备品、备件的名称及数量
- * 特殊使用条件

Information for ordering

Customers are supposed to note the following when ordering:

- * Type, name, main technical parameters and ordering quantity of the circuit breaker
- * Whether it is with disconnecter, the quantity and variation of CTs for protection and measurement
- * Operating voltage for operating mechanism
- * Name and quantity for spare parts
- * Particular working conditions, if any.

ZW8-12/T

型户外中压真空断路器

Low-Voltage Withdrawable Switchgear Cubicle



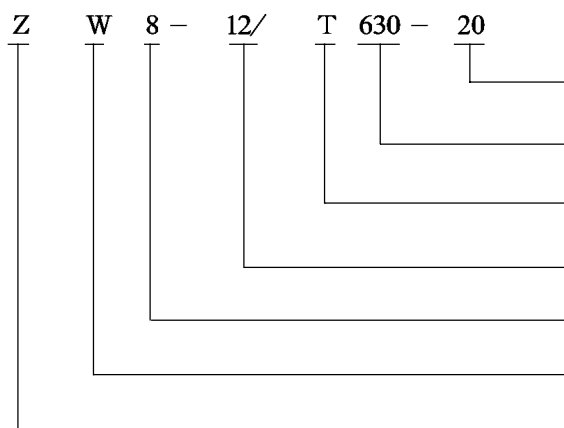
概述

ZW8-12/T 型户外中压真空断路器（以下简称断路器）用于交流 50Hz、电压 10 -12KV 的三相电力系统，作为分断、关合负荷电流之用，它具有过载及短路保护功能，还可根据用户需要配装浪涌电流延时保护器和加装避雷器或隔离开关（即断路器与隔离开关组合，以下简称“组合断路器”）等。

General

ZW8 - 12/T Outdoor AC Medium Voltage Vacuum Circuit Breaker is competently used in three-phase 50Hz 10 -12kV electric power systems for switching on and off load current with overload and short circuit protective functions. It may also be equipped with surge current time delay protector and surge arrester or disconnector on requirement of customers. The circuit breaker equipped with a disconnector is referred to as the combined circuit breaker.

型号意义



额定短路开断电流
Rated short circuit breaking current (kA)
额定电流
Rated current (A)
弹簧操作机构
Spring operating mechanism
额定电压
Rated voltage (kV)
设计序号
Design serial number
户外型
Outdoor
真空断路器
Vacuum circuit breaker

使用环境条件

- * 周围空气温度：上限 + 40℃，下限 - 30℃
- * 海拔：≤ 1000m（若需增高海拔，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 8 度
- * 污秽等级：Ⅲ级
- * 最大日温差：不超过 25℃

Working conditions

- * Ambient temperature: -30℃ ~ +40℃
- * Altitude above sea level: ≤ 1000 meters; if it is working in higher altitude, insulating level should be upgraded accordingly
- * Wind pressure: Not over 700 Pa, corresponding to wind speed of 34m/s
- * Earthquake not over Force 8
- * Pollution level: III
- * Maximum daily temperature difference: ≥ 25℃.

主要技术参数 Main technical parameters

序号	名称 Description		单位 Unit	数据 Value
1	额定电压		KV	12
2	1min工频耐压	干试		42
		湿试		34
	雷电剖面耐压（峰值）			75
3	额定电流		A	630；400；200
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	额定短路开断电流次数		次	30
7	额定短路关合电流（峰值）		kA	50
8	额定峰值耐受电流		kA	50
9	额定短时耐受时间			20
10	额定短路持续时间		s	4
11	分闸时间（分励脱扣）	最高操作电压	ms	15～50
		额定操作电压		30～60
		最低操作电压		25～50
12	合闸时间			≤100
13	全开断时间		≤20	
14	燃弧时间			10000
15	机械寿命		次	70
16	合闸功		J	≤250
17	储能电机额定输入功率		W	DC220、110、24
18	额定操作电压及辅助回路额定电压		V	AC220、110、24
19	额定电压下储能时间		s	<10
20	过电流脱扣器	额定电流	A	5
		脱扣电流准确度	%	±10

外形及安装尺寸图

Overall and installing dimensions

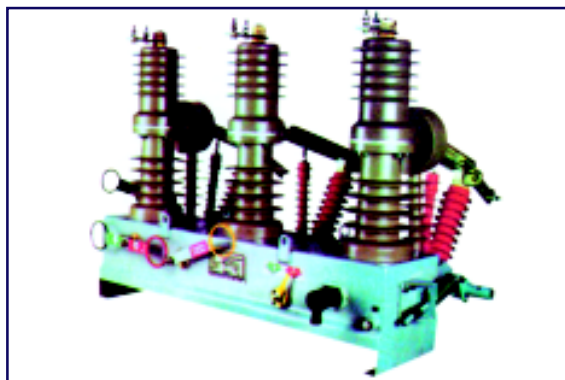
断路器外形尺寸及安装尺寸图

1. 接触刀片 2. 触刀 3. 绝缘拉杆 4. 支柱
5. 隔离开关操作手柄 6. 转轴 7. 隔离开关支架 8. 断路器
组合断路器结构及外形、安装尺寸图

ZW32-12

型户外中压真空断路器

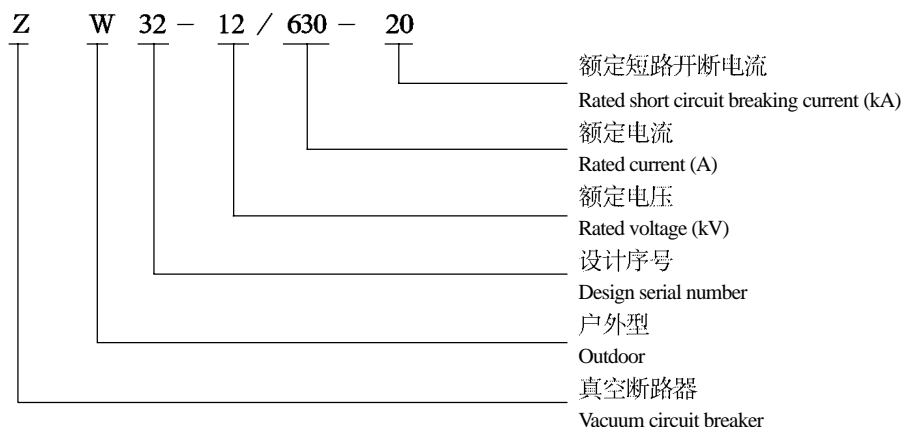
Low-Voltage Withdrawable Switchgear Cubicle



概述

ZW32-12 型户外中压真空断路器（以下简称断路器）用于交流 50Hz、电压 10~12KV 的三相电力系统，作为分断、关合负荷电流之用，它具有过载及短路保护功能，满足控制、测量要求、还可实现远方控制、监视等。适用于变电站及工矿企业配电系统中作保护合控制之用及农村电网中频繁操作场所。

型号意义



General

ZW32 - 12 Outdoor Medium Voltage Vacuum Circuit Breaker is competently used in three-phase 50Hz 10-12kV electric power systems for switching on and off load current. With overload and short circuit protective functions, it satisfies the requirements of control and measurement and still, realizes remote control, monitoring and others. It is suitably applied in substations, distributing systems in industrial and mineral enterprises for protection and control, and in rural electric systems for frequent operations.

使用环境条件

- * 周围空气温度：上限 + 40℃，下限 - 30℃
- * 海拔：≤ 2000m（若需增高海拔，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 8 度
- * 污秽等级：Ⅲ级
- * 最大日温差：不超过 25℃

Working conditions

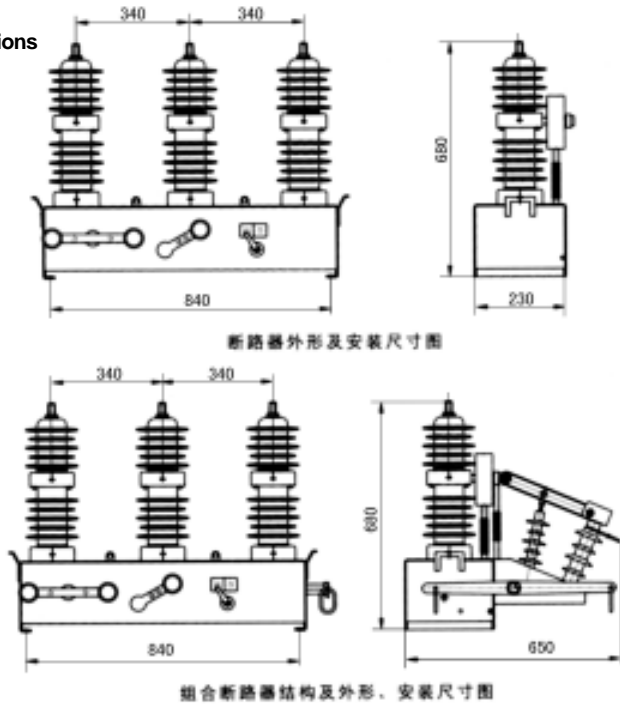
- * Ambient temperature: -30℃ ~ +40℃
- * Altitude above sea level: ≤ 2000 meters; if it is working in higher altitude, insulating level should be upgraded accordingly
- * Wind pressure: Not over 700 Pa, corresponding to wind speed of 34m/s
- * Earthquake not over Force 8
- * Pollution level: III
- * Maximum daily temperature difference: ≥ 25℃

主要技术参数 Main technical parameters

序号	名称 Description		单位 Unit	数据 Value
1	额定电压		KV	12
2	额定绝缘水平	1min工频耐压		42
		干试		34
	雷电剖面耐压（峰值）			湿试
3	额定电流		A	630； 400； 200
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	额定短路开断电流次数		次	30
7	额定短路关合电流（峰值）		kA	50
8	额定峰值耐受电流		kA	50
9	额定短时耐受时间			20
10	额定短路持续时间		s	4
11	分闸时间（分励脱扣）	最高操作电压	kV	20～45
		额定操作电压		
		最低操作电压		
12	合闸时间			25～50
13	全开断时间			≤100
14	燃弧时间			≤20
15	机械寿命		次	10000
16	合闸功		J	70
17	储能电机额定输入功率		W	≤40
18	额定操作电压及辅助回路额定电压		V	DC220
				AC220
19	额定电压下储能时间		s	<10
20	过电流脱扣器	额定电流	A	5
		脱扣电流准确度	%	±10

外形及安装尺寸图

Overall and installing dimensions



ZW7-40.5

型户外中压真空断路器

Low-Voltage Withdrawable Switchgear Cubicle



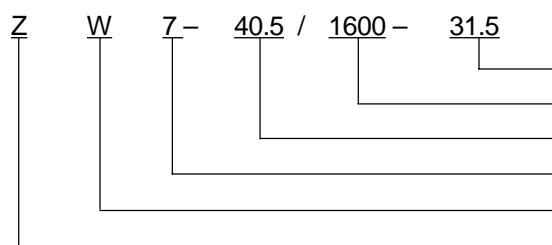
概述

ZW7-40.5 型户外中压真空断路器（以下简称断路器）用于交流 50 Hz、电压 40.5kV 的三相电力系统，作为分断、关合负荷电流、过载电流及短路电流之用。

主要特点

- * 采用真空灭弧，开断能力强，电寿命长，机械寿命 10000 次
- * 机构简单，免维护，不检修周期长
- * 绝缘性能好，抗污秽能力强
- * 可配弹簧或电磁操动机构，机械性能可靠，可频繁操作，无火灾和爆炸隐患
- * 内装电流互感器计量精度 0.2 级，可实现三相差动作保护
- * 内附凝露控制器，能保持断路器在一定的温度湿度下可靠运行。

型号意义 Type designation



使用环境条件

- * 周围空气温度：上限 + 40℃，下限 - 30℃
- * （一般地区）、-40℃（高寒地区）
- * 海拔：≤ 1000m（若需增高海拔，则额定绝缘水平相应提高）
- * 风压：不超过 700pa（相当于风速 34m/s）

General

ZW 7 - 40.5 Outdoor Medium Voltage Vacuum Circuit Breaker is competently used in three-phase 50Hz 40.5kV electric power systems for switching on and off load current, breaking overload current and short circuit current.

Main features

- * With vacuum interrupter, it is of high breaking capacity, long electric endurance and 10000 in mechanical endurance.
- * Simple structure, maintenance-free, long interval for reparation.
- * Excellent insulating performance and high capacity for anti-pollution.
- * Either spring or electromagnetic operating mechanisms can be equipped with in reliable mechanical performance, frequent operation, no potential conflagration and explosion.
- * Built-in current transformer with metering accuracy up to Class 0.2 to realize three phase differential protection.
- * Equipped condensing controller keeps the circuit breaker working reliably under a certain controlled temperature and humidity.

额定短路开断电流 Rated short circuit breaking current (kA)
额定电流 Rated current (A)
额定电压 Rated voltage (kV)
设计序号 Design serial number
户外型 Outdoor
真空断路器 Vacuum circuit breaker

Working conditions

- * Ambient temperature: -30℃ ~ +40℃ in general area and -40℃ in cold area
- * Altitude above sea level: ≤ 1000 meters; if it is working in higher altitude, insulating level should be upgraded accordingly;
- * Wind pressure: Not over 700 Pa, corresponding to wind speed of 34m/s

- * 振幅：地震烈度 8 度

* 污秽等级：Ⅲ级

* 最大日温差：不超过 25℃

* Earthquake not over Force 8

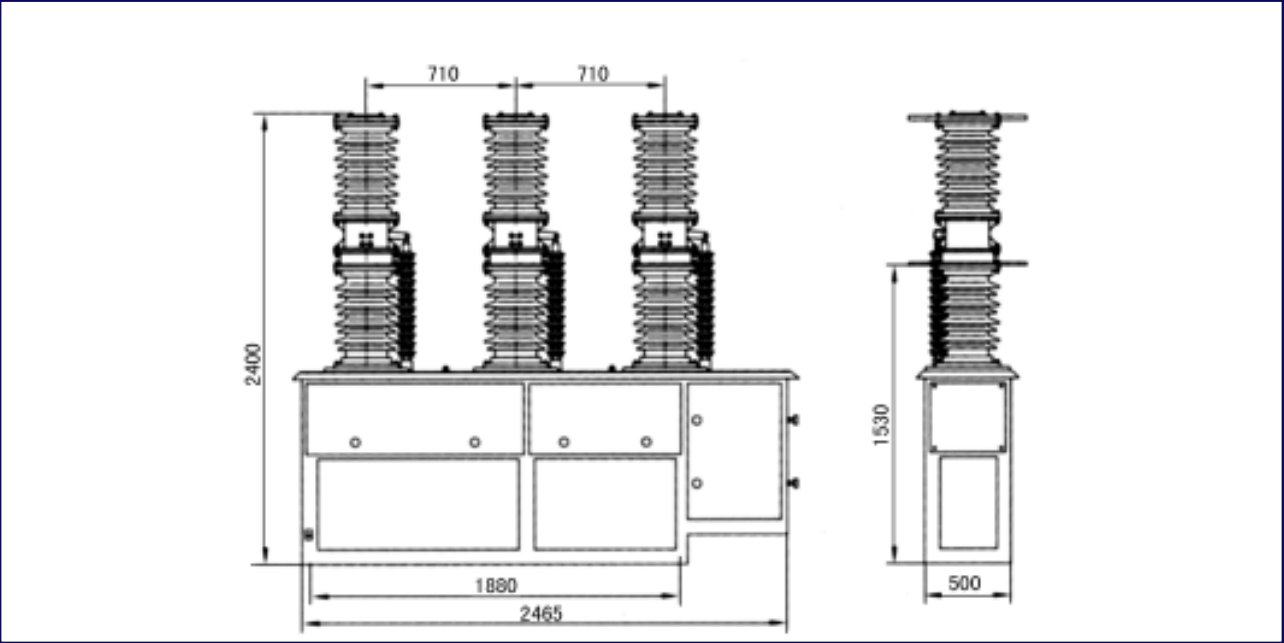
* Pollution level: Ⅲ

* Maximum daily temperature difference: > 25℃.

主要技术参数 Main technical parameters

序号	名称 Description		单位 Unit	数据 Value	
1	额定电压		KV	40.5	
2	额定绝缘水平	1min工频耐压		干试	95
				湿试	80
	雷电剖面耐压（峰值）				185
3	额定电流		A	1250; 1600; 2000	
4	额定短路开断电流		KA	20; 25; 31.5	
5	额定操作顺序			分-0.3s-合分-180s-合分	
6	额定短路开断电流次数		次	12	
7	额定短路关合电流（峰值）		KA	50、63、80	
8	额定峰值耐受电流				
9	额定短时耐受电流				
10	额定短路持续时间		s	4	
11	平均分闸速度		m/s	1.5 ± 0.2	
12	平均合闸速度			0.7 ± 0.2	
13	触头合闸弹跳时间		ms	≤ 2	
14	三相合（分）闸同期性时差			≤ 2	
15	合闸时间			≤ 150	
16	分闸时间			≤ 60	
17	机械寿命		次	10000	
18	额定操作电压及辅助回路额定电压		V	DC110/220	
				AC110/220	
19	每相回路直流电阻（不含互感器）		μ Ω	≤ 100	
20	动静触头允许磨损厚度		mm	3	
21	重量		kg	800	

外形及安装尺寸图 Overall and installing dimensions



ECCM1

系列塑料外壳式断路器

Series Intelligent AIR Circuit Breaker



适用范围

ECCM1系列塑料外壳式断路器(以下简称断路器),是本公司采用国际先进设计,制造技术研发、开发的新型断路器之一。其额定绝缘电压为800V,适用于交流50Hz(60Hz),额定工作电压690V以下(直流250V及以下),额定工作电流至1250A的电路中作不频繁转换及电动机不频繁启动之用。断路器具有过载、短路和欠电压保护装置,能保护线路和电源设备不受损坏。

断路器按照其额定极限短路分断能力(Icu)的高低,分为C型(基本型)、L型(标准型)、M型(较高分断型)、H型(高分断型)四类。该断路器具有体积小、分断高、飞弧短(部分规格零飞弧)、抗振动等特点,更是陆地及船舶使用的理想产品。

- * 本断路器可垂直安装(即竖装),亦可水平安装(即横装)。
- * 本断路器产品执行下列标准:
 - IEC 947 1 及 GB14048.1 总则
 - IEC 947 2 及 GB14048.2 低压断路器
 - IEC 947 4 及 GB14048.4 接触器和电动机起动器
 - IEC 947 5.1 及 GB14048.5 机电式控制电路电器

适用工作环境

- * 海拔高度2000m以下;
- * 周围介质温度不高于+40℃(对船用产品为+45℃)和不低于-5℃;
- * 能耐受潮湿空气的影响;
- * 能耐受盐雾、油雾的影响;
- * 能耐受霉菌的影响;
- * 能耐受核辐照的影响;
- * 最大倾斜度为22.5°;
- * 在受到船舶正常振动时能可靠工作;
- * 在受到地震情况下(4g)能可靠工作;
- * 在无爆炸危险的介质中,且介质无足以腐蚀金属和

Application

ECCM1 Series Molded Case Circuit Breaker is one of new type of MCCBs designed and developed by ECC with internationally advanced design and manufacturing echnologies. With rated insulating voltage AC 800V, it works suitably in circuit of AC 50Hz/60Hz, nominal voltage up to 690V (DC up to 250V), rated working current up to 1250A for infrequent switching and motor' s infrequent starts. Equipped with overload, short circuit and undervoltage protective devices, the circuit breaker protects circuits and power supplies from damage.

In accordance with the ultimate short circuit breaking capacity Icu, the circuit breaker may be divided into type C (basic), type L (typical), type M (high breaking) and type H (very high). As an ideal electrical apparatus used in land and submarine, the circuit breaker features compact, high breaking capacity, short flashover (zero flashover for some specifications of it), shock proof.

◆ The circuit breaker may be both vertically or horizontally mounted.

◆ The circuit breaker complies with the following standards and codes:

- * IEC 947 - 1 and GB 14048.1 "General"
- * IEC 947 - 2 and GB 14048.2 "Low Voltage Circuit Breker"
- * IEC 947 - 4 and GB 14048.4 "Contactor and Motor' s Starter"
- * IEC 947 - 5.1 and GB 14048.5 "Electromechanically Controlled Circuit Electric Apparatus"

Working conditions

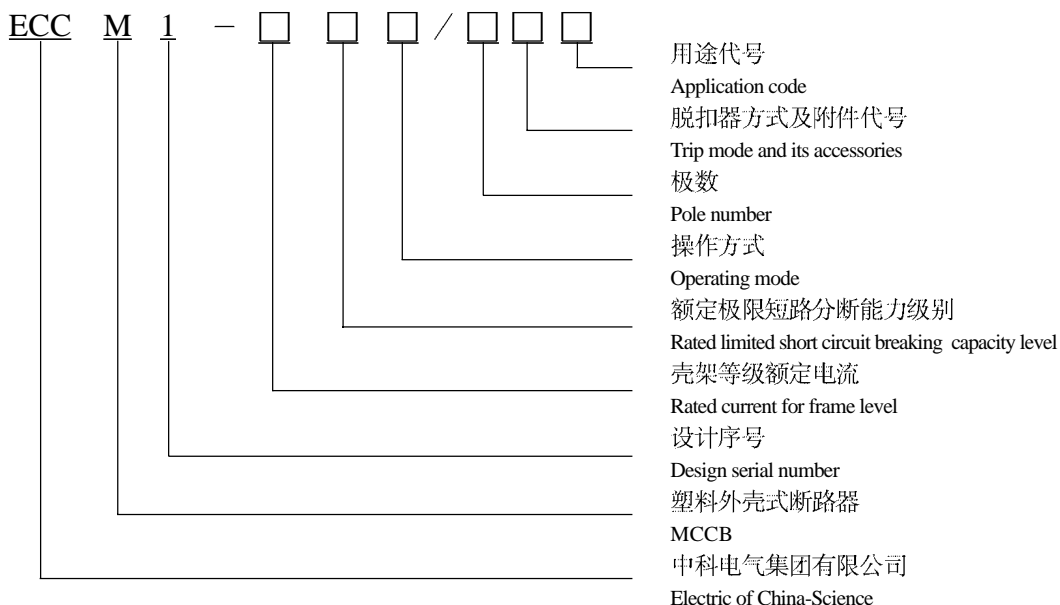
- * Altitude above sea level not over 2000 meters
- * Ambient temperature not lower than -5℃ nor higher than +40℃ (+45℃ for marine product)
- * Withstanding impact from moisture, smoke fog, salt mist and oil mist, fungus and nuclear radiation
- * In places where the maximum inclination is 22.5°
- * Working reliably under the condition of normal shock in ship
- * Working reliably under earthquake of 4g
- * In places where there is no potential explosion, nor such gaseous strong enough as to corrode metals and damage insulation, nor conductive dust and particles

破坏绝缘的气体与导电尘埃的地方；

* 在没有雨雪侵袭的地方。

* No exposed to rains and snows.

型号意义 Type designation

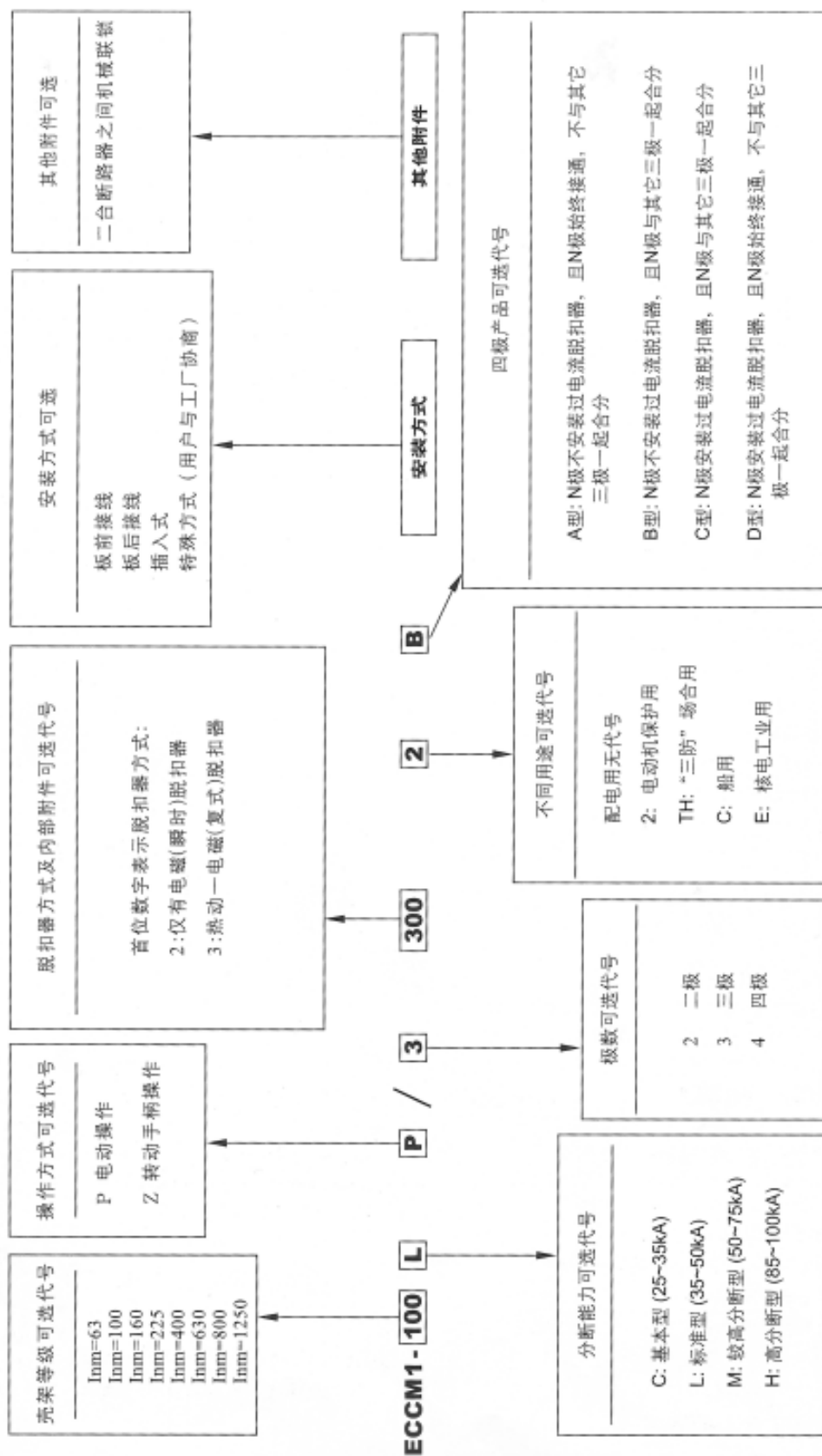


注:

- * 配电用断路器无代号；保护电动机用断路器以 2 表示。
- * 手柄直接操作无代号；电动操作用 P 表示；转动手柄用 Z 表示。
- * 按产品极数分为二极(100、225 型)、三极与四极(ECCM1-1250 无四极)。四极产品中中性极(N 极)的型号分四种：
 - A 型：N 极不安装过电流脱扣元件，且 N 极始终接通，不与其它三极一起合分；
 - B 型：N 极不安装过电流脱扣元件，且 N 极与其它三极一起合分；(N 极先合后分)；
 - C 型：N 极安装过电流脱扣元件，且 N 极与其它三极一起合分；(N 极先合后分)；
 - D 型：N 极安装过电流脱扣元件，且 N 极始终接通，不与其它三极一起合分。
- * 按额定电流(A)分：
 - ECCM1-63 为(6)、10、16、20、25、32、40、50、63A 九级(6A 规格无过载保护)；
 - ECCM1-100 为(10)、16、20、25、32、40、50、63、80、100A 十级；
 - ECCM1-160 为100、125、140、160四级；
 - ECCM1-225 为100、125、140、160、180、200、225A 七级；
 - ECCM1-400 为225、250、315、350、400A 五级；
 - ECCM1-630 为400、500、630A 三级；
 - ECCM1-800 为630、700、800 三级；[带()为不推荐规格]
 - ECCM1-1250 为800、1000、1250A 三级。
- * 按接线方式分为板前接线、板后接线、插入式三种。
- * 按过电流脱扣器型式分热动—电磁(复式)型、电磁(瞬时)型两种。
- * 按附属装置分带附属装置和不带附属装置两种：附属装置分内部装置和外部装置；
 - * 内部装置有分励脱扣器、欠电压脱扣器、辅助触头、报警触头四种；
 - * 外部装置有转动手柄操作机构、电动操作机构、联锁机构及辅助装置的接线端子等。

ECCM1系列塑壳断路器快速选用表

快速选用表见表






举例:

- 如订ECCM1-100M三极, 电动机保护用, 额定电流为80A并带分励脱扣器、辅助触头, 板前接线且要求两台带机械联锁机构, 即写为订ECCM1-100M/33402In=80A, 板前接线2台机械联锁。
- 如订ECCM1-225四极, 配电用, 额定电流为180A并带电动操作机构及分励脱扣器, N极安装过电流脱扣器, 且N极与其它三极一起合分形式, 板后接线10台, 即写为订ECCM1-225P/4310C型, In=180A板后接线10台。

脱扣器方式及附件代号

脱扣器方式及附件代号见下表

 手柄
 左面安装  右面安装 
 □ 报警触头
 ■ 辅助触头
 • 分励脱扣器
 ○ 欠电压脱扣器
 → 引线方向

附件代号	附件名称	型号 极数	ECCM1-63 100		ECCM1-160 225		ECCM1-400 630		ECCM1-630H 800	
			3	4	3	4	3	4	3	
208、308	报警触头		←□□	←□□	←□□	←□□	←□□	←□□	←□□	
210、310	分励脱扣器		←•□□	←•□□	←•□□	←•□□	←•□□	←•□□	←•□□	
220、320	辅助触头		←■□□	←■□□	←■□□	←■□□	←■□□	←■□□	←■□□	
230、330	欠电压脱扣器		□□○→	□□○→	□□○→	□□○→	□□○→	□□○→	□□○→	
240、340	分励脱扣器 辅助触头		←•■□□	←•■□□	←•■□□	←•■□□	←•■□□	←•■□□	←•■□□	
250、350	分励脱扣器 欠电压脱扣器		←•□□○→	←•□□○→	←•□□○→	←•□□○→	←•□□○→	←•□□○→	←•□□○→	
260、360	二组辅助触头		←■□■□	←■□■□	←■□■□	←■□■□	←■□■□	←■□■□	←■□■□	
270、370	辅助触头 欠电压脱扣器		←■□□○→	←■□□○→	←■□□○→	←■□□○→	←■□□○→	←■□□○→	←■□□○→	
218、318	分励脱扣器 报警触头		←□□•□	←□□•□	←□□•□	←□□•□	←□□•□	←□□•□	←□□•□	
228、328	辅助触头 报警触头		←■□□□	←■□□□	←■□□□	←■□□□	←■□□□	←■□□□	←■□□□	
238、338	欠电压脱扣器 报警触头		←□□□○→	←□□□○→	←□□□○→	←□□□○→	←□□□○→	←□□□○→	←□□□○→	
248、348	分励脱扣器 辅助触头 报警触头		←■□□•□	←■□□•□	←■□□•□	←■□□•□	←■□□•□	←■□□•□	←■□□•□	
268、368	二组辅助触头 报警触头		←■□■□□	←■□■□□	←■□■□□	←■□■□□	←■□■□□	←■□■□□	←■□■□□	
278、378	辅助触头 欠电压脱扣器 报警触头		←■□□□○→	←■□□□○→	←■□□□○→	←■□□□○→	←■□□□○→	←■□□□○→	←■□□□○→	

注：

- * 200：表示仅有电磁脱扣器的断路器本体；
- * 300：表示带有热动—电磁脱扣器的断路器本体；
- * 000：不带脱扣器的断路器本体；
- * 对ECCM1—100、225二极产品只有210、310、220、320、230、330；
- * 对ECCM1—63、100及ECCM1—160、225四极断路器，N极为A型和D型中无240、340、260、360、218、318、248、348、268、368；
- * 对ECCM1—400、ECCM1—630及ECCM1—800、1250，其中248、348、278、378规格中辅助触头为一对触头(即一常开、一常闭)，268、368规格中的辅助触头为三对触头。

保护特性

断路器热动型脱扣器具有反时限特性；电磁脱扣器为瞬时动作，特性见表(配电用)及表(保护电动机)用。

脱扣器额定电流(A)	热动型脱扣器 (环境温度 陆用+40℃，船用+45℃)		电磁脱扣器动作电流(A)
	1.05In(冷态) 不动作时间(h)	1.30 In(热态) 动作时间	
In ≤ 63	≥ 1	< 1	10 In ± 20%
63 < In ≤ 125	≥ 2	< 2	
125 < In ≤ 1250	≥ 2	< 2	5In ± 20% 10In ± 20%

脱扣器额定电流(A)	热动型脱扣器 (环境温度 陆用+40℃，船用+45℃)				电磁脱扣器动作电流(A)
	1.0In(冷态) 不动作时间(h)	1.20 In(热态) 动作时间(h)	1.50In(热态) 动作时间	7.2In(冷态) 动作时间	
10 ≤ In ≤ 225	≥ 2	< 2	4min	4S < Tp ≤ 10S	12 In ± 20%
225 < In ≤ 1250			8min	6S < Tp ≤ 20S	

断路器主要技术性能指标

型号	额定电流	极数	额定绝缘电压(V)	额定工作电压(V)	飞弧距离(mm)	额定极限短路分断能力(KA)	额定运行短路分断能力(KA)	电气寿命	机械寿命
MMI-6L	6, 10, 16, 20, 25	二、三、四极	800V	690V以下	0	25	18	2000	10000
MMI-6M	32, 40, 50, 63				0	50	35		
MMI-100C	10, 16, 20,				0	25	18		
MMI-100L	25, 32, 40,				0(≤ 50)	35	22		
MMI-100M	50, 63,				0(≤ 50)	50	35		
MMI-100H	80, 100				0(≤ 50)	85	50		
MMI-22C	100, 125				≤ 50	25	18	2000	10000
MMI-22S	140, 160				≤ 50	35	22		
MMI-22M	180, 200				≤ 50	50	35		
MMI-22H	225				≤ 50	85	50		
MMI-40C	225, 250				≤ 50	35	25	1000	5000
MMI-40L	315, 350				≤ 50	50	35		
MMI-40M	400				≤ 100	65	42		
MMI-60C	400				≤ 100	35	25		
MMI-60L	500				≤ 100	50	35		
MMI-60M	630				≤ 100	65	42		
MMI-60H					≤ 100	100	65		
MMI-80M	630, 700				≤ 100	75	50		
MMI-80H	800				≤ 100	100	65		
MMI-120H	800, 1000, 1250				≤ 120	100	65	1000	2000

使用与维修

- * 断路器各种特性及附件由制造厂整定, 在使用中不可随意调节。
- * 断路器手柄可以处在三个位置, 分别标示闭合、断开、脱扣三种状态, 当手柄处于脱扣位置时, 应向后扳动手柄, 使断路器再扣, 然后合闸。
- * 在用户遵守保管和使用条件下, 从制造厂发货之日起, 不超过 18 个月, 断路器封印完好, 产品如因制造质量问题而发生损坏或不能正常使用时, 制造厂负责无偿更换和修理。

订货须知

用户在订货时, 必须将断路器的型号、规格、所配附件写清楚, 采用欠电压脱扣器和分励脱扣器时, 应注明工作电压(或控制电源电压)的电压值。

- * 例1. 如订ECCM1-100M三极、配电用、额定电流为50A, “0”飞弧并带转动手柄操作机构、分励脱扣器(AC400V)、辅助触头、报警触头、板后接线20台。即写为订ECCM1-100MZ/3348, In=50A“0”飞弧, 分励脱扣器AC400V, 板后接线20台。
- * 因产品技术需不断改进, 所有数据应以本公司最新数据确认为准, 如有变动, 恕不另行通知。本产品的版权和解释权属中科电气集团有限公司。

Warranty

If the circuit breaker is in damage or it does not work normally within 18 months from the date of delivery caused by manufacturing quality with intact seal under the condition that the customer really follows storage regulations or the circuit breaker works in specified working conditions, the manufacturer is responsible for replacement and reparation free of charge.

Information for ordering

Type, number, specification and accessories needed of the circuit breaker should be noted clearly. If undervoltage trip and shunt trip are adopted, mark the working voltage or control voltage.

- * Specification will be subjected to change without notice.

ECW1

系列塑料外壳式断路器

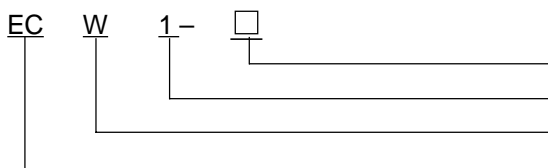
Series Intelligent AIR Circuit Breaker



用途

ECW1 智能型万能式断路器 (以下简称断路器) 的额定电压为交流 50Hz 400V、690V, 额定电流为 630V—2000A。主要在配电网中用来分配电能和保护线路及电源设备免受过载、欠电压、短路、接地故障等的危害。断路器核心部件采用智能型扣器, 具有精确的选择性保护, 可避免不必要的停电, 提高供电可靠性。

型号意义 Type designation



型式

安装方式: 固定式; 抽屉式。

操作方式: 电动操作兼手动操作。

脱扣器种类: 具有智能型脱扣器、欠电压瞬时 (或延时) 脱扣器和分励脱扣器。

智能型脱扣器功能

- * 具有过载长延时反时限、短延时反时限、瞬时动作等保护功能, 可由用户自行设定, 组成所需的保护特性
- * 接地故障保护功能
- * 过载报警功能
- * 试验功能
- * 负载监控功能
- * 显示功能
- * 自诊功能
- * MCR功能
- * 热模拟功能
- * 触头损耗指示

Applications

ECW1 Intelligent Air Circuit Breaker (hereafter referred as breaker), with rated voltage A.C.50Hz 400V、690V, and rated current 630 - 2000A, is mainly used for distribution in electric-network and protection of lines from damage overload, undervoltage, short-circuit, and earth faults. The intelligent releases are used as key part of the breakers. They make the breaker work with accuracy in reliability in power supply is improved greatly.

断路器壳架等级额定电流 Rated frame current (A)
设计序号 Design code
万能式断路器 ACB
中科电气集团 Electric of China-science

Types

Installing mode: fixed version; draw-out version;

Operating mode: motor-driven and manual operated;

Release types: intelligent release、undervoltage release (instantaneous or delay) and shunt release.

Functions of intelligent release

- * Overload protection
Long time delay inverse time. Short time delay inverse time, short time delay definite time and instantaneous trip just as needs of customers.
- * Earthed fault protection
- * Overload alarm
- * Test
- * Load-monitoring
- * Indicating
- * Self-diagnosis
- * MCR
- * Thermo-analogue
- * Contact waste indicating
- * Fault memory

- * 故障记忆功能

正常工作条件和安装条件

- * 周围空气温度为 -5°C ~ $+40^{\circ}\text{C}$ ，且24h的平均值不超过 $+35^{\circ}\text{C}$ (特殊订货的除外)
- * 安装地点的海拔不超过2000m
- * 安装地点的空气相对湿度在最高温度为 $+40^{\circ}\text{C}$ 时不超过50%；在较低温度下可以有较高的相对湿度，最湿月的月平均最低温度不超过 $+25^{\circ}\text{C}$ ，该月的月平均最大相对湿度不超过90%，并考虑因温度变化发生在产品表面上的凝露。
- * 污染等级为3级
- * 断路器主电路及欠电压脱扣器线圈、电源变压器初级线圈的安装类别为4，其余辅助电路、控制电路安装类别为3
- * 断路器的垂直倾斜度不超过 5°

技术数据 Technical data

断路器基本参数 Basic parameters of circuit breaker

型号 Type	壳架等级 额定电流 Rated Frame current A	额定电流 Rated Current A	额定电压 Rated Voltage V	额定绝 缘电压 Rated Insulation Voltage V	额定极限短 路分断能力 Limited Short-Circuit Breaking Capacity kV		额定运行短 路分断能力 Rated Working Short Breaking Capacity kV		额定短时 耐受电流 Short-Time With Stand Current kV(Is)		功率损耗 Power loss W
ECW1-2000	2000	630	AC50Hz	800	400V	690V	400V	690V	400V	690V	360
		800									
		1000	400		80	50	50	50	50	50	
		1250									
		1600	690								
		2000									

注：飞弧距离为零。Note: Arc-distance is "0".

结构概述

断路器结构紧凑，具有立体分隔式的特点。触头系统封闭在具有分隔结构的两绝缘底版之间，每相触头都隔开形成一个个小室。而智能型脱扣器、操作机构、手动和电机操作机构依次排在其前面形成各自独立的单元，如其中某一单元坏了，可将该单元整个拆下换上新的。

Environment conditions for operation and installation

- * Ambient temperature: -5°C ~ $+40^{\circ}\text{C}$, and average temperature in 24 hours below $+35^{\circ}\text{C}$ (except for special orders).
- * Installing site height: <2000m above sea level.
- * Relative humidity: not exceeding 50% at the maximum ambient temperature of $+40^{\circ}\text{C}$. With lower temperature, higher humidity permitted, but the lowest temperature not exceeding $+25^{\circ}\text{C}$, and the maximum average relative humidity not exceeding 90%, and giving consideration to the dews on the goods surface, which would appear due to temperature change.
- * Pollution protection: 3 degree.
- * Installing categories: 4 for breakers' main circuits, coils of undervoltage releases and primary side of transformers; 3 for auxiliary circuits and control circuits.
- * The installation of breakers should be done as the article number 7 of this instruction. The vertical gradient is less than 5°

Construction

The breaker has compact structure, and feature 3D separated construction. The contact system is sealed between two isolated bases which are separated. Each phase contacts are divided and fixed in several compartments. In front of them, release, mechanism, manual-mechanism and motor-mechanism are arranged to form respective unit. If any of them is out of work, the spoil unit could be replaced with new one.



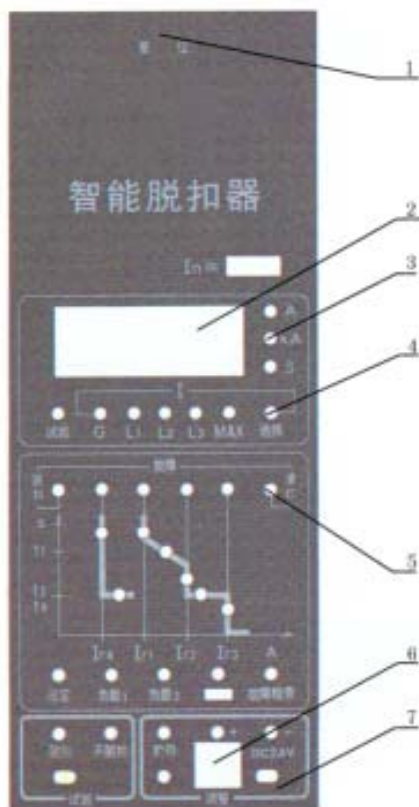
安装使用及维护 Installation and maintenance

安装

- * 安装前先检查断路器的规格是否符合要求。
- * 安装前先以500V兆欧表检查断路器绝缘电阻,在周围介质温度 $20^{\circ}\text{C} \pm 5^{\circ}\text{C}$ 和相对湿度50%~70%应不小于 $10\text{M}\Omega$,否则应烘干,待绝缘电阻达到要求方可使用。
- * 断路器安装时,断路器应居于垂直位置,并用M10螺钉固定。
- * 断路器安装时应进行可靠的保护接地。
- * 断路器安装完毕并按有关接线图接线后,在主电路通电前(抽屉式断路器即抽屉座上的指示指在试验位置)应进行下列操作试验。
 - a) 检查欠电压脱扣器、分励脱扣器及释能电磁铁、电动储能机构的额定电压与所接电源电压是否相符,然后二次回路通电(欠电压脱扣器应吸合,断路器才能操作)
 - b) 上下扳动面板上的手柄,七次后面板显示“储能”,并听到“咔嚓”一声,即储能结束,按动“1”按钮或释能电磁铁通电,断路器可靠闭合,扳动手柄能再次储能
 - c) 将电动机源接通,电动机通电操作至面板显示“储能”,并伴随“咔嚓”一声,储能结束,电动机自动断电,按动“1”按钮或释能电磁铁通

Installation

- * Check the specifications of circuit breaker before installation.
- * Check the insulating resistance with 500V megameter, which should not be less than $10\text{M}\Omega$ when ambient temperature is $20^{\circ}\text{C} \pm 5^{\circ}\text{C}$ and relative humidity 50% - 70% . Otherwise, make the requirement by baking.
- * Put the circuit breaker vertically and fix with M10 screws.
- * The grounding for safety should be reliable.
- * After finishing the installation and connection in accordance with the wire diagram and before the main circuit is energized (the indicator pointer is on “test” position), the following operation tests should be carried out:
 - a) Check the rated voltage of undervoltage release, shunt release, energy release solenoid and motor-driven energy-storage system in terms of the voltage of power supply, then energize the secondary circuit (circuit breaker could be operated only the undervoltage is closed).
 - b) Draw downward and upward the handle on the panel for seven times, the panel would show “energy-stored”, then a click tells the energy-storing process finished. Press the button “1” or energize the release solenoid, the circuit breaker would be reliably closed. Turn the handle, the energy - storing could be repeated again.
 - c) Switch on the motor until the panel showing “energy-stored” and following a click , motor is de-energized automatically. Press button “1” or energize the release solenoid , the circuit breaker would be closed reliably, and the motor would charge energy again.



- 1.故障脱扣复位按钮
断路器脱扣后,需将此按钮按下,方可再次闭合断路器。
 - 2.电流表显示
显示各相运行电流及接地故障电流,正常显示最大相电流,同时还可以显示整定、试验及故障的电流值或时间值。
 - 3.发光二极管指示
指示各整定、试验及故障状态和类别。
 - 4.按键
可整定、试验及故障状态和类别。
 - 5.“清灯”键
按此键后,脱扣器复位进入正常运行状态。整定、试验、故障后均需按此键方可闭合断路器。
 - 6.测试电流杆孔
 - 7.防护罩
脱扣器进入正常运行后因应加封防护罩保护整定参数。
- 1.reset button
After tripping,only press the button can the circuit breaker be closed again.
 - 2.Ammeter
Indicating the working current for each phase,earth fault current and maximum phase current,also indicating current and time for setting, test and faults.
 - 3.LED indicator
Showing the setting, test, fault and categories.
 - 4.buttons
For setting, test and inspection.
 - 5.“clearing” button
Press the button, the release would be reset and put into normal working condition.After setting, test and faults, the breaker would be closed only by pressing the “clearing”button.
 - 6.measuring jack
 - 7.protection cover
Protection for setting value after release in normal working condition.

电，断路器可靠闭合，此时电动机又通电贮能

d) 断路器闭合后，无论用欠电压脱扣器、分励脱扣器、面板上的“0”按钮或智能型脱扣器的脱扣试验，均应使断路器断开。

智能型脱扣器的使用

* 智能型脱扣器参数的整定

用“设定”、“+”、“-”、“贮存”四个键，即可对脱扣器各种参数进行整定，包括接地故障电流和时间整定，长延时电流和时间整定，短延时电流和时间整定，瞬时电流整定，负载监控电流整定。按“设定”键至所需要整定的状态（状态指示灯亮），然后按“+”“-”键，按“+”键为递增，按“-”键为递减，每按一次键，接地故障电流、长延时电流及负载监控电流以2%递变；短延时电流以4%递变；瞬时电流以8%递变，调整参数大小至所需值，再按一下“贮存”键，贮存指示灯亮一次表示整定值已锁定。最后按清灯键，脱扣器进入正常运行状态。

注意脱扣器的保护参数不得交叉设定。

运行

断路器闭合前或智能型脱扣器每次整定、试验或故障脱扣后，必须按一下“清灯”键，使脱扣器进入正常运行。断路器闭合前还必须按一下机械联锁“复位”按钮。

连续按动“设定”键可循环指示各种设定。检查后按“清灯”键，以便使脱扣器进入正常运行（1min内不按则自动进入正常运行状态）。

脱扣器进入正常运行后，应加封防护罩，保护整定参数。

断路器运行过程中，脱扣器显示其运行电流。按脱扣器的“选择”键可循环显示各相运行电流或最大相电流和接地故障电流。

维护

使用中发现铁芯有特殊噪声时，应将工作极面用防锈油擦清，重新涂上清洁的防锈油脂。

定期在各转动部分注入润滑油。

定期清刷灰尘，以保持断路器绝缘良好。

定期检查触头系统，特别在每次短路分断后应进行检查。

检查内容：

- * 灭弧罩
- * 触头（接触是否良好）
- * 连接部位的紧固（如各部件的螺丝是否松动）
- * 软联结

在不经维护达到电气寿命时，需要换灭弧罩，而经过维护达到电气寿命时则需要更换灭弧罩和触头。

不经维护达到机械寿命，需要更换电动机贮能操作机构和主触头两根机构弹簧。

d) As the circuit breaker closed, you could make the breaker released, whatever using the undervoltage release, shunt release, “0” button or tripping test of the intelligent release.

Use of the intelligent release

With the buttons of “setting”, “+”, “-” and “charging”, all the parameters could be set, including the earth fault current and set time, inverse long delay and set time, inverse short delay and set time, instantaneous set current and load - monitoring set current. Pressing the “setting” button to the required position (indicator lights), then with “+” or “-” button, the parameter would be changed to the required value the button “+” for increase and “-” for decrease, the current of earth fault, long time delay, load monitoring changes in 2% for each pressing, short time delay in 4%, and instantaneous in 8%, then pressing the “charging” button, the “charging” light would be on a short while to show the setting value locked. At last, pressing the “clearing” button, the release would be on normal working condition.

Note that protective parameters should not be set acrossingly.

Operation

Before closing the circuit breaker or after each setting, test or tripping of the release, pressing the “clearing” button is necessary, and the release would be in normal working condition. It would be also necessary to press the “return” button of mechanical interlock before closing the circuit breaker.

Pressing the “setting” button continually, each setting would be shown cyclically. After testing, pressing the “clearing” button, the release would be in normal working condition (otherwise the release would go to normal working condition automatically within 1 min.).

A protection cover is needed for setting parameters as release in normal working.

During the operation of circuit breaker, release would indicate the working current. Pressing “selection” button of release, working current of each phase, maximum phase current and earthing current would be indicated.

Maintenances

Clear the working surface with antirust oil, smear the antirust grease when abnormal noise comes.

Fill in lubricating - oil periodically.

Clear the circuit breaker regularly to keep the insulation well.

Take periodical inspection on the contact system, especially after each short - circuit breaking.

The following parts are to be inspected:

- * arc - chamber
- * acontacts (connect well or not)
- * fasteners of each junction
- * flexible connections.

The arc - chamber and contacts should be replaced when their electrical duration is up.

The energy - storage system driven by motor and the springs of main contact should be replaced as their lifetime is up.

订货规范

断路器订货规范见表。

(请在□内打√或填人上数字)

用户单位		订货台数		订货日期	
型号	<input type="checkbox"/> EC W1-2000(I 框) <input type="checkbox"/> EC W1-3200(II 框)	<input type="checkbox"/> 固定式 <input type="checkbox"/> 抽屉式	<input type="checkbox"/> 三极 <input type="checkbox"/> 四极	额定电流 $I_n =$ A 额定电压 <input type="checkbox"/> AC380(400)V <input type="checkbox"/> AC660(690)V	
智能 控制 器	基本功能				可增选附加功能或附件
	L 型	<input type="checkbox"/> L2	长延时、瞬时(3~10) I_n		1. 负载光柱指示 2. MCU 运行监视 3. 故障状态指示 4. 故障记忆 5. 瞬动试验功能
		<input type="checkbox"/> L3	长延时、短延时(3~10) I_n 瞬时(10~20) I_n [I 框](7~14) I_n [II 框]		
		<input type="checkbox"/> L4	长延时、短延时(3~10) I_n 瞬时(10~20) I_n [I 框](7~14) I_n [II 框] 单相接地故障保护		
智能 控制 器	M 型	<input type="checkbox"/> M	长延时、短延时、瞬时、单相接地故障保护		1. 各种状态指示和数值显示; 2. 电流表 3. 故障记忆 4. 热记忆 5. 试验
	H 型	<input type="checkbox"/> H	1. 长延时、短延时、瞬时、负载监控; 2. 单相接地故障保护; 3. 各种状态指示和数值显示; 4. 电流表; 5. 电压表; 6. 故障记忆; 7. 热记忆; 8. 试验; 9. RS485 串行接口; 10. 报警故障状态。		<input type="checkbox"/> 1. 负载监控 <input type="checkbox"/> 方式一 <input type="checkbox"/> 2. 电压表 <input type="checkbox"/> 方式二 <input type="checkbox"/> 3. MCR 接通分断和模拟脱扣 <input type="checkbox"/> 4. 预报警、自诊断 OCR 脱扣报警用信号单元
	控制器电源		<input type="checkbox"/> AC220V <input type="checkbox"/> AC380V		<input type="checkbox"/> MCR 接通分断和模拟脱扣 <input type="checkbox"/> RS485/232 转换器 <input type="checkbox"/> 电源变压器 <input type="checkbox"/> -220V <input type="checkbox"/> -380V <input type="checkbox"/> -220V <input type="checkbox"/> -110V <input type="checkbox"/> DP 模块
附 件	<input type="checkbox"/> 欠电压脱扣器		<input type="checkbox"/> AC220V <input type="checkbox"/> AC380V <input type="checkbox"/> 欠电压瞬时脱扣器 <input type="checkbox"/> 欠电压延时脱扣器 <input type="checkbox"/> 1s <input type="checkbox"/> 3s <input type="checkbox"/> 5s		
	<input type="checkbox"/> 分励脱扣器		<input type="checkbox"/> AC220V <input type="checkbox"/> AC380V <input type="checkbox"/> DC220V <input type="checkbox"/> DC110V		
	<input type="checkbox"/> 释能(合闸)电磁铁		<input type="checkbox"/> AC220V <input type="checkbox"/> AC380V <input type="checkbox"/> DC220V <input type="checkbox"/> DC110V		
	<input type="checkbox"/> 电动操作机构		<input type="checkbox"/> AC220V <input type="checkbox"/> AC380V <input type="checkbox"/> DC220V <input type="checkbox"/> DC110V		
	<input type="checkbox"/> 机械联锁		<input type="checkbox"/> 水平联锁 <input type="checkbox"/> 垂直联锁 <input type="checkbox"/> 门联锁		
	<input type="checkbox"/> 断开位置钥匙锁				
	<input type="checkbox"/> 门框				
	<input type="checkbox"/> 外接单相接地互感器		<input type="checkbox"/> 差值型(矢量和) <input type="checkbox"/> 地电流型		
连接	<input type="checkbox"/> 水平连接 <input type="checkbox"/> 垂直连接				
备注					

注: 1) 如用户选用控制器可增选附加功能或附件, 需另行增加费用。

2) L 型控制器的长延时整定值为 I_n 的 10% 每档递减。



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