



MVG2-12



MVG4-12



MVG-12S



MVG-40.5

MVG系列高压真空断路器

MVG Series High-Voltage Vacuum Circuit Breaker

智能电气专家
服务中国电力

Intelligent Electric Experts
Service China Electric Power



ALSBURG

阿斯博开关

源自德国 电气精品

Quality Electrical from Germany

MVG系列高压真空断路器源自德国，系德国ALSBURG公司为满足中国市场对高品质真空断路器的需求，并且兼顾与国内主流开关柜的适配需要，而推出的新一代型真空断路器。

MVG series HV vacuum circuit breaker originates from Germany, and is the new generation vacuum circuit breaker launched by the German ALSBURGE Company to meet the demand for high quality vacuum circuit breaker in Chinese market while giving consideration to the need of adaptation to the domestic mainstream switch cabinet.



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产品概述 Overview

技术特点

- 主导电回路采用固体绝缘固封极柱的结构形式;
- 超长使用寿命, 高度可靠的模块化弹簧操动机构;
- 满足智能电网对开关元件的功能要求, 主动管理运行风险;
- 完全满足 GB1984、DL/T403、IEC62271-100、VDE0670及其他先进工业化国家的标准规范要求。

试验

MVG2-12型高压真空断路器已通过了以下的各种试验, 可以确保其在正常使用条件下安全运行。

- 型式试验: 工频耐压、雷电冲击耐压、温升、短时和峰值耐受电流、短路电流开合能力及电缆充电电流开合试验。

- 出厂试验: 机械特性测试、主回路工频耐压试验、辅助和控制回路绝缘性能试验、主回路电阻测试、联锁操作试验、机械和电气操作试验。

功能配置及解决方案

- MVG2固封式高压真空断路器

Technical Features

- Structural type of solid insulated and solid encapsulated post terminals adopted by the main circuit;
- Ultra-long service life, and highly reliable modular spring operating mechanism;
- Meet the functional requirement for the switch element by the intelligent grid, and manage operation risks actively;
- Fully meet the requirements of GB1984, DL/T403, IEC62271-100, VDE0670 and standards and codes of other advanced industrialized countries.

Test

MVG2-12 HV vacuum circuit breaker passed following tests, to ensure safe operation under normal operating conditions.

- Type test: power frequency withstand voltage, lightning impulse withstand voltage, temperature rise, short-duration and peak value withstand voltage, short circuit current switching capability and cable charging current switching test.

- Delivery test: mechanical characteristic test, main circuit power frequency withstand voltage test, auxiliary and control circuit insulation performance test, main circuit resistance test, interlocked operation test, mechanical and electrical operation test.

Functional Configuration and Solutions

- MVG2 enclosed type HV vacuum circuit breaker

应用场合

- MVG2-12型高压真空断路器可广泛用于电网、电厂、冶金、石化、城市基础设施建设如机场、楼宇、地铁等项目;
- MVG2-12型高压真空断路器在配电系统中, 可适用于控制和保护电缆、架空线、变压器、电动机、发电机和电容器组。

安全运行

MVG2-12型高压真空断路器拥有完善的机械和电气联锁装置, 配合适当的开关柜可完成安全的配电功能, 同时可确保操作者及设备的安全。

Applications

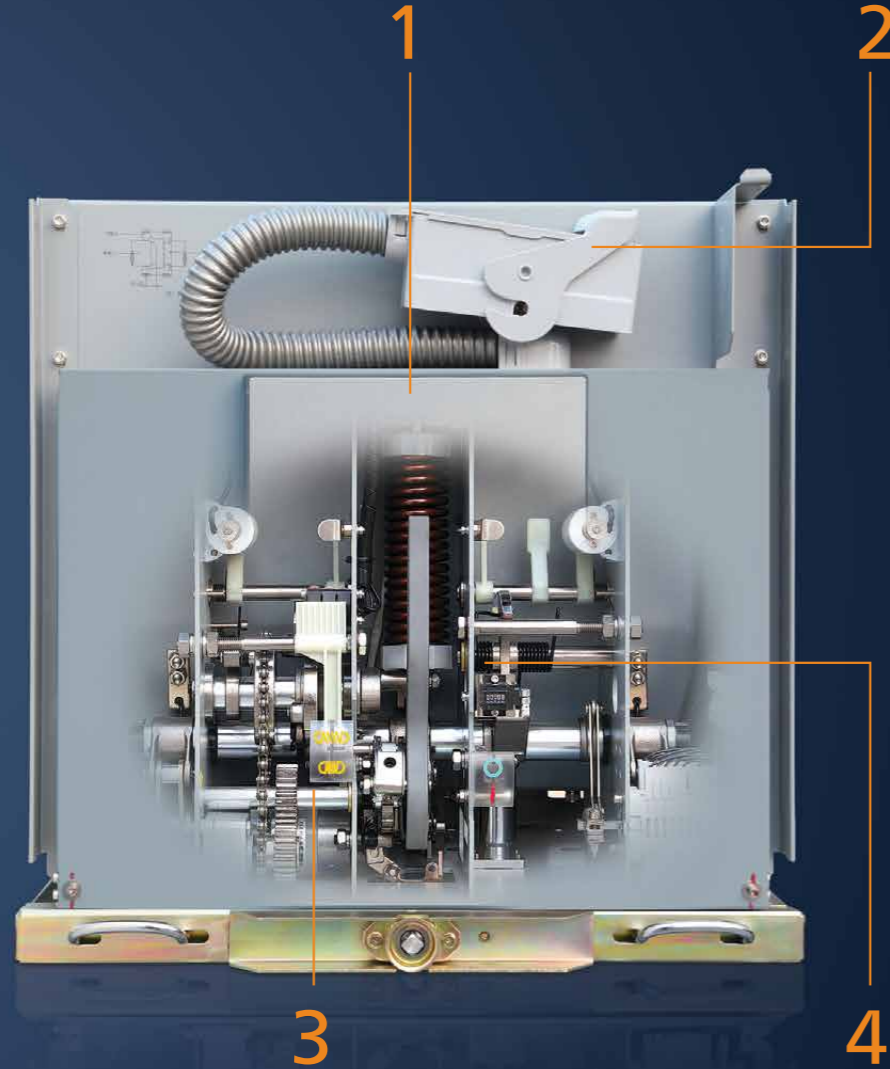
- MVG2-12 HV vacuum circuit breaker can be extensively applied to the grid, power plant, metallurgy, petrochemical, urban infrastructure construction, such as airport, buildings, subway, etc.
- In the power distribution system, MVG2-12 HV vacuum circuit breaker can be applicable to control and protective cable, overhead line, transformer, motor, generator and capacitor bank.

Safe Operation

MVG2-12 HV vacuum circuit breaker has complete mechanical and electrical interlocking device. Working with appropriate switch cabinet, it can perform safety power distribution function, while ensuring safety of the operators and equipment.



产品特征
Product Features

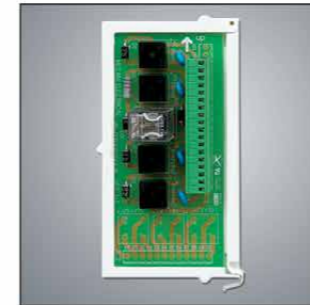


- ① 主弹簧采用德国格鲁伯弹簧
The main spring is the German Gruber spring
- ② 预留智能在线监测接口
Reserve intelligent online monitoring interfaces
- ③ 50000次超长使用寿命
50,000 times ultra-long service life
- ④ 为客户提供更高的使用价值
Provide customers with higher value

Mubea



断路器弹簧操动机构
Drive Mechanism



线路板
Circuit board

模块化二次控制线路板，采用带自扣紧的插接头，既方便更换，也保证了电气连接的可靠性。

The modular secondary control circuit board adopts the plug connector with self-fastening, facilitating replacement, while ensuring the reliability of the electrical connections.



合闸单元
Closing unit

合闸单元结构简单，动作原理可靠，不仅从根本上杜绝了合闸后不能保持、拒分等故障的发生，而且降低了分闸所需的脱扣功。

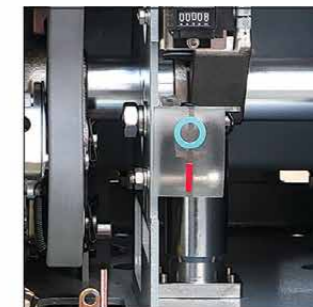
Closing unit has simple structure, reliable operating principle, not only fundamentally eliminating the faults after closing such as failure to maintain and failure to open, but also reducing trip work required for opening.



合分闸电磁铁
Closing and opening electromagnet

电磁铁采用全封闭结构设计，保证线圈不受潮。

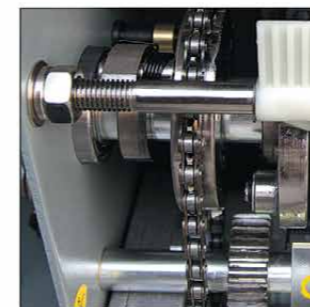
The electromagnet is of fully enclosed structure design to ensure that the coil does not get wet.



分闸缓冲器
Opening buffer

高性能的分闸缓冲器可减少断路器在分闸时动触头过冲或反弹幅值，降低了断路器分闸时电弧重燃的概率，并保证了真空灭弧室波纹管的使用寿命。

High-performance opening buffer can reduce the overshoot or rebound amplitude of the circuit breaker at time of opening, reducing the probability of arc restriking at time of opening of the circuit breaker and ensuring the mechanical life of the bellows of the vacuum arc-extinguishing chamber.



表面处理
Surface treatment

80%的机构零件表面采用镀镍磷合金处理，大大提高了零部件的防腐能力，确保机械始终如一的品质。

80% of the mechanism parts surface is subject to nickel-phosphorus alloy treatment, greatly improving the corrosion resistance of parts, ensuring consistent stable quality of the machinery.



整体优点
Overall advantages

操动机构结构简单、动作可靠，不同规格产品的零部件通用性强，由于该机构完全由我公司自主研发，因而可根据用户的不同要求定制特殊产品。

Actuator has simple structure and reliable operation. Parts of the products of different specifications have good universality. As the mechanism is completely researched and developed by our company, special product can be customized according to different requirements of the users.



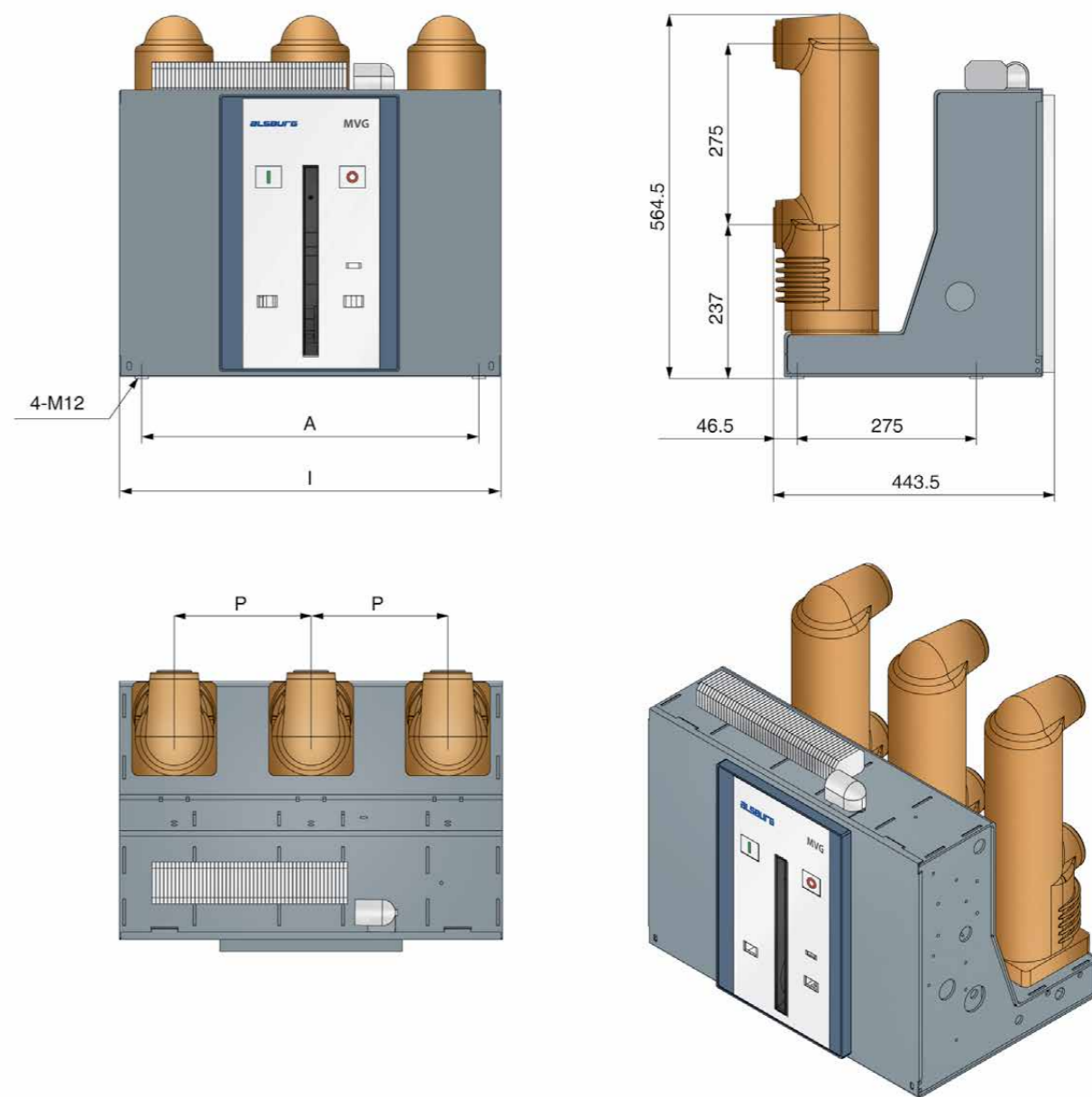
Every Detail to
Achieve Excellence

每一细节都力求精益求精!

MVG2

固封式高压真空断路器（小电流固定式）外形尺寸

Outline Dimension of Enclosed Type HV Vacuum Circuit Breaker (Low Current Fixed Type)



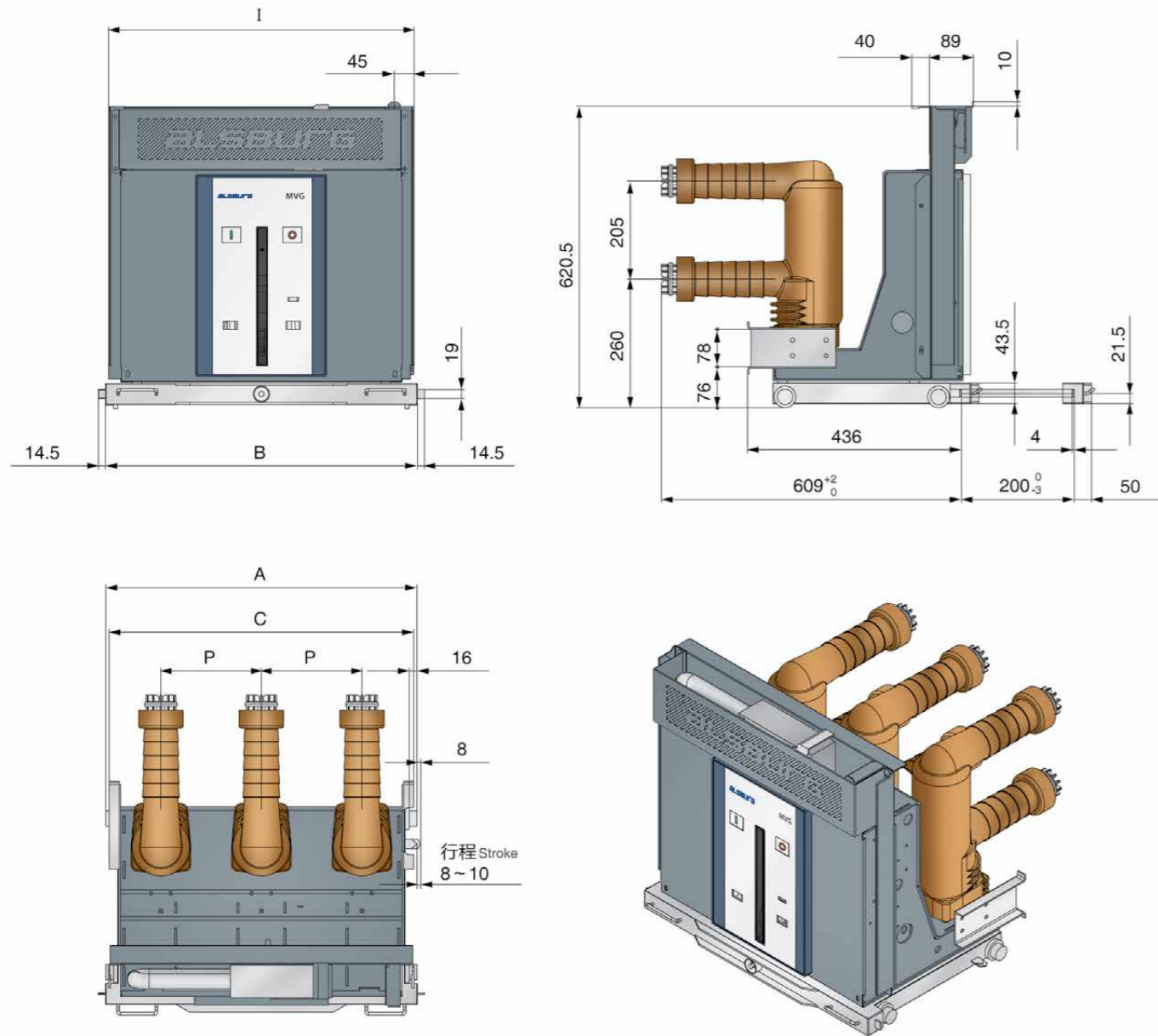
额定电流 (A) Rated current	额定短路开断电流 (kA) Rated short-circuit breaking current	P (mm)	A (mm)	I (mm)	配套柜宽 (mm) Supporting cabinet width
630 ~ 1250	20...*50	150	410	460	650
630 ~ 1600		210	520	588	800
		275	720	770	1000

- 主回路采用固封极柱
Main circuit adopts solid-sealed post terminal
- *此规格为特殊型号，订货前请与本公司技术人员联系
*This specification is the special model, please contact our technical personnel before placing orders

MVG2

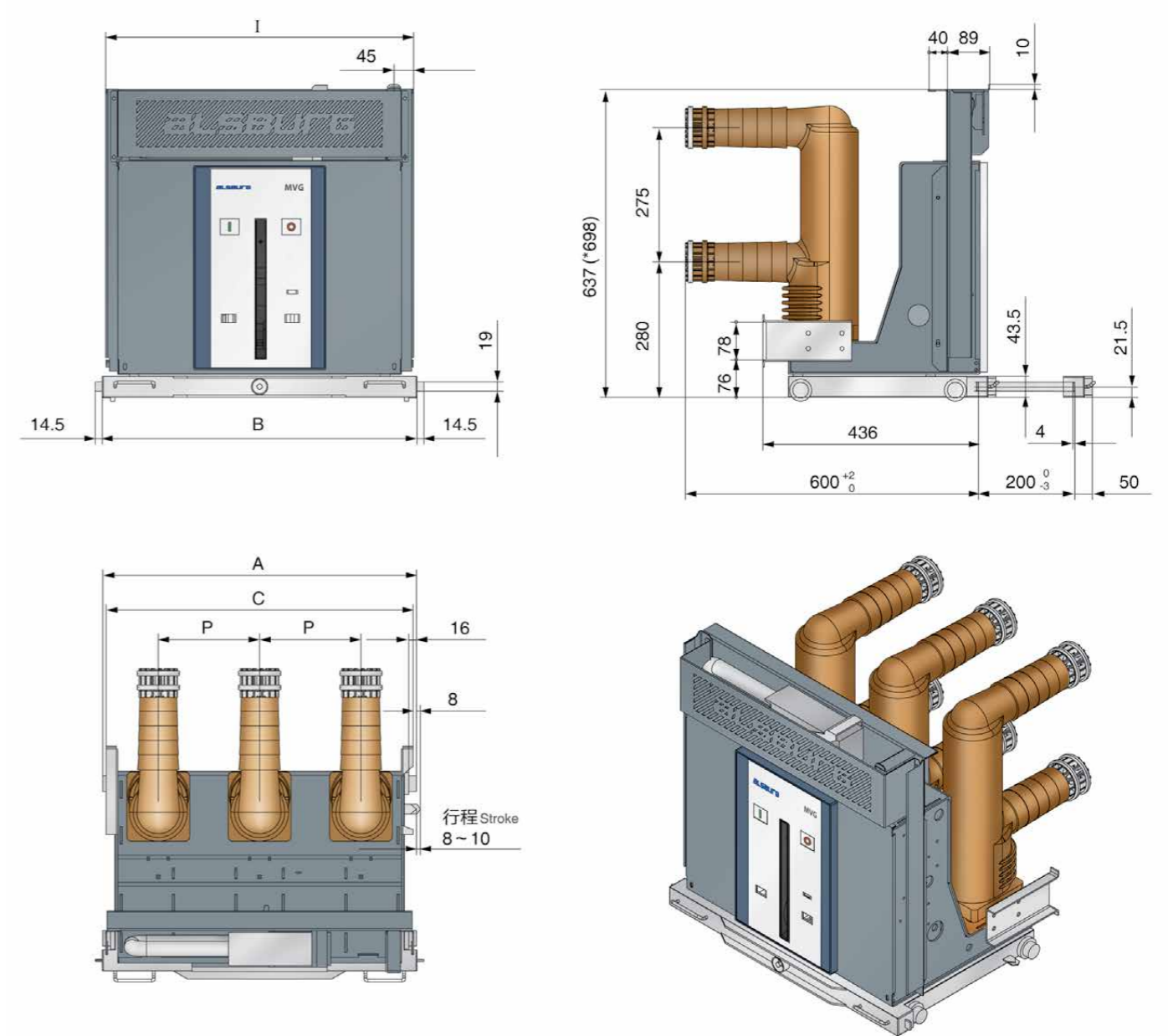
固封式高压真空断路器（小电流手车式）外形尺寸

Outline Dimension of Enclosed Type HV Vacuum Circuit Breaker (Low Current Handcart-Type)



固封式高压真空断路器（小电流手车式）外形尺寸

Outline Dimension of Enclosed Type HV Vacuum Circuit Breaker (Low Current Handcart-Type)



额定电流 (A) Rated current	额定短路开断电流(kA) Rated short-circuit breaking current	P (mm)	A (mm)	B (mm)	C (mm)	I (mm)	配套柜宽 (mm) Supporting cabinet width	动静触头 配合尺寸 Fit dimension of dynamic and static contacts	额定电流 (A) Rated current	梅花触头 Tulip contact	静触头尺寸 Static contact dimension
630 ~ 1250	20...*50	150	502	503	492	492	650	630 ~ 1250	CT-24	Ø35	
630 ~ 1600		210	650	653	640	638	800				
		275	850	853	838	842	1000				1600

1. 主回路采用固封极柱

Main circuit adopts solid-sealed post terminal

2. *此规格为特殊型号，订货前请与本公司技术人员联系

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额定电流 (A) Rated current	额定短路开断电流(kA) Rated short-circuit breaking current	P (mm)	A (mm)	B (mm)	C (mm)	I (mm)	配套柜宽 (mm) Supporting cabinet width	动静触头 配合尺寸 Fit dimension of dynamic and static contacts	额定电流 (A) Rated current	梅花触头 Tulip contact	静触头尺寸 Static contact dimension
630 ~ 1250	20...*50	150	502	503	492	492	650	630 ~ 1250	CT-24	Ø35	
630 ~ 1600		210	650	653	640	638	800				
		275	850	853	838	842	1000				1600

1. 主回路采用固封极柱

Main circuit adopts solid-sealed post terminal

2. 图示中 (*698) 为相间距275的封板高度的可选方案

(*698) in the drawing is the alternative of the sealing plate height with the phase spacing 275

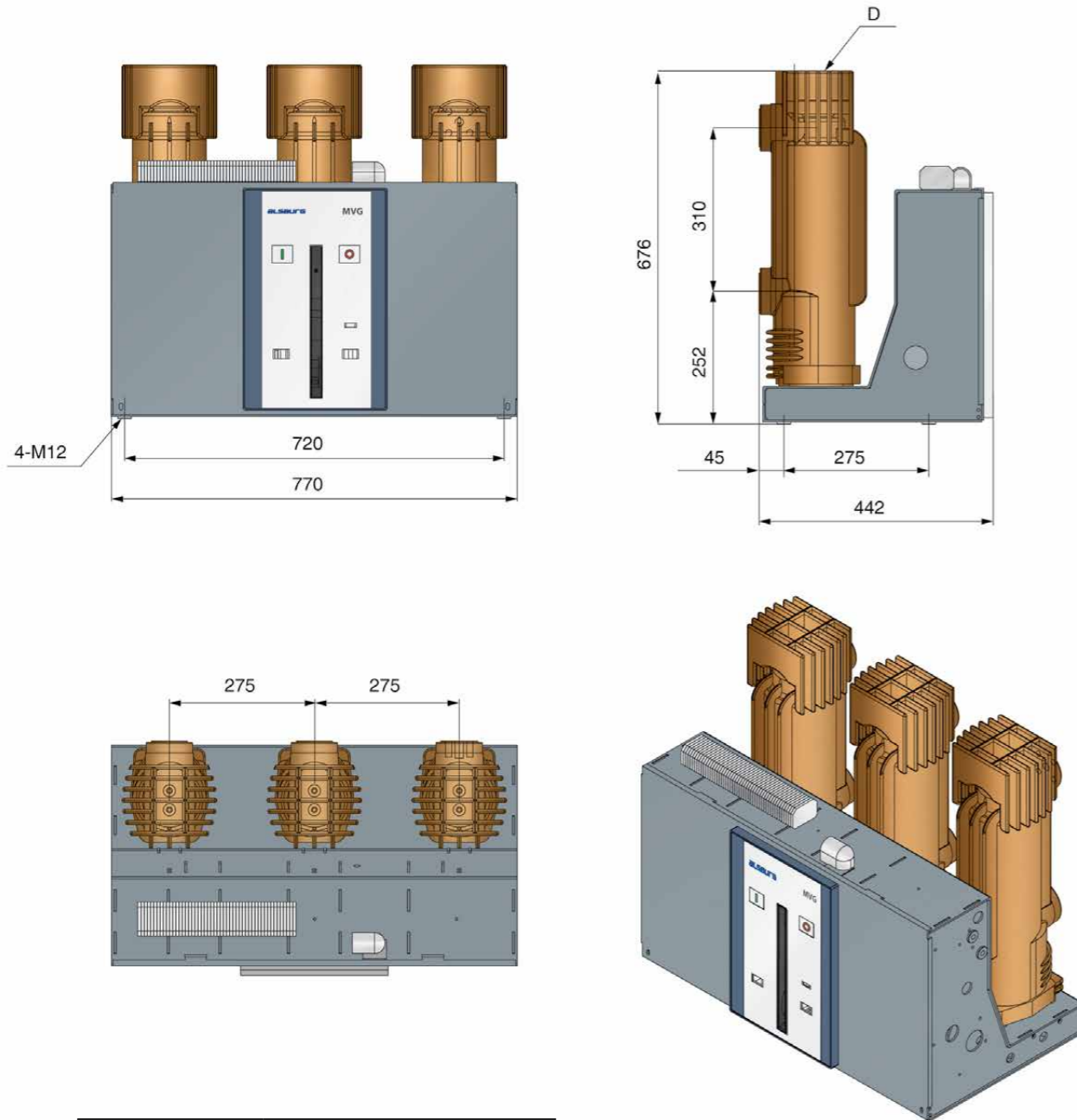
3. *此规格为特殊型号，订货前请与本公司技术人员联系

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固封式高压真空断路器（大电流固定式）外形尺寸

Outline Dimension of Enclosed Type HV Vacuum Circuit Breaker (High Current Fixed Type)



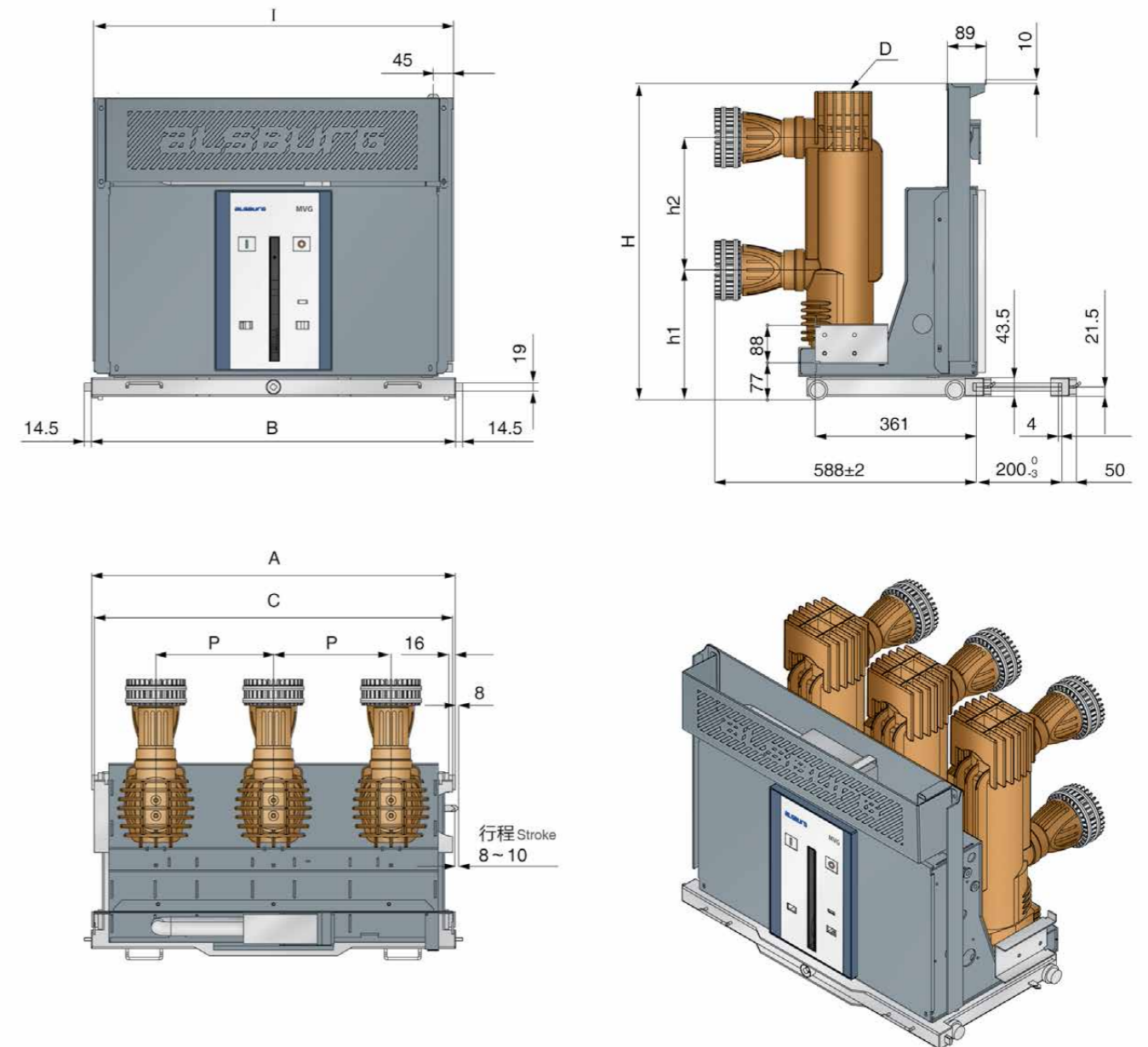
额定电流 (A) Rated current	额定短路开断电流(kA) Rated short-circuit breaking current
1600 ~ 4000	31.5...*50
*4000	50

- 主回路采用固封极柱
Main circuit adopts solid-sealed post terminal.
- 当额定电流2500A及以上时，断路器须带冷却罩D
When the rated current is 2500A and above, the circuit breaker shall be provided with cooling shroud D.
- 采用强迫风冷时，额定电流可达4000A
When forced air cooling is adopted, the rated current is up to 4000A.
- *此规格为特殊型号，订货前请与本司技术人员联系
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固封式高压真空断路器（大电流手车式）外形尺寸

Outline Dimension of Enclosed Type HV Vacuum Circuit Breaker (High Current Handcart-Type)



额定电流 (A) Rated current	额定短路开断电流(kA) Rated short-circuit breaking current	P (mm)	A (mm)	B (mm)	C (mm)	H (mm)	I (mm)	h1/h2 (mm)	配套柜宽(mm) Supporting cabinet width	动静触头配合尺寸 Fit dimension of dynamic and static contacts	额定电流 (A) Rated current	梅花触头 Tulip contact	静触头尺寸 Static contact dimension
1600 ~ 2000	31.5...*50	275	850	853	838	698	842	295/310 280/310	1000	dimension of dynamic and static contacts	1600 ~ 2000	CT-48	Ø79
2500 ~ 4000		275	850	853	838	735	842				2500 ~ 3150	CT-64	Ø109
*4000	50							4000	CT-82				

- 主回路采用固封极柱
Main circuit adopts solid-sealed post terminal
- 当额定电流2500A及以上时，断路器须带冷却罩D
When the rated current is 2500A and above, the circuit breaker shall be provided with cooling shroud D
- 采用强迫风冷时，额定电流可达4000A
When forced air cooling is adopted, the rated current is up to 4000A
- *此规格为特殊型号，订货前请与本司技术人员联系
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固封式高压真空断路器 主要技术参数

Enclosed Type HV Vacuum Circuit Breaker Main Technical Parameters

项 目 Item	单位 Unit	技术数据 Technical data				
额定电压 Rated voltage	kV	12				
额定绝缘水平 Rated insulation level	额定短时工频耐受电压 (1min) Rated power-frequency short-duration withstand voltage(1min)	kV	42			
	额定雷电冲击耐受电压 (峰值) Rated lightning impulse withstand voltage (peak value)	kV	75			
额定频率 Rated frequency	Hz	50				
额定电流 Rated current	A	630	630	1250	1250	3150
		1250	1250	1600	1600	
额定短路开断电流 Rated short-circuit breaking current	kA	20	25	31.5	40	50
额定短时耐受电流 Rated short-time withstand current	kA	20	25	31.5	40	50
额定峰值耐受电流 Rated peak withstand current	kA	50	63	80	100	125
额定短路关合电流 (峰值) Rated short-circuit making current (peak value)	kA	50	63	80	100	125
4s热稳定电流 4s thermal stability current	kA	20	25	31.5	40	50
额定动稳定电流 Rated dynamic current	kA	50	63	80	100	125
额定电容器组合涌流 Rated capacitor bank inrush making current	kA	12.5 (频率不大于1000Hz/frequency not more than 1000Hz)				
额定单个/背对背电容器组开断电流 Rated single/back-to-back capacitor bank breaking current	A	630 / 400				
额定短路持续时间 Rated duration of short-circuit	S	4				
二次回路工频耐受电压 Power-frequency withstand voltage of secondary circuit	V	2000				
额定操作电压 Rated operational voltage	合闸线圈 Closing coil	V AC 110 / 220 DC 110 / 220				
	分闸线圈 Opening coil	V AC 110 / 220 DC 110 / 220				
	储能电机 Energy-storage motor	V AC 110 / 220 DC 110 / 220				
分闸时间 (额定电压) Opening time (rated voltage)	ms	20 ~ 50				
合闸时间 (额定电压) Closing time (rated voltage)	ms	30 ~ 70				
动、静触头允许磨损累计厚度 Permit abrasion total thickness of dynamic and static contacts	mm	3				
储能时间 Energy storage time	s	≤ 15				
触头开距 Clearance between open contacts	mm	9 ± 1				
接触行程 Contacting travel	mm	3 ~ 4				
触头合闸弹跳时间 Jump time of contact close brake	ms	≤ 2				
三相分、合闸不同期性 Three-phase opening, closing non-synchronism	ms	≤ 2				
平均分闸速度 ¹ Average opening speed ¹	m/s	0.9 ~ 1.3				
平均合闸速度 ² Average closing speed ²	m/s	0.4 ~ 1.0				
触头分闸反弹幅值 Contact opening rebound amplitude	mm	≤ 2				
主导回路电阻 Main galvanic circle resistance	μΩ	≤ 55 (630A)				
		≤ 45 (1250A)				
		≤ 35 (1600A ~ 2000A)				
		≤ 25 (2500A以上 / above 2500A)				
触头合闸接触压力 Contact closing rebound amplitude	N	2000 ± 200 (20kA)				
		2400 ± 200 (25kA)				
		3100 ± 200 (31.5kA)				
		4750 ± 200 (40kA)				
额定操作顺序 ³ Rated operating sequence ³		分 Opening - θ - 合分 Closing opening -180s-合分 Closing opening				
机械寿命 Mechanical life	次	50000 (31.5kA及以下 / 31.5kA and below)				
		20000 (40kA及以上 / 40kA and above)				

- 平均分闸速度是指断路器触头刚分后6mm的平均速度;
The average opening speed refers to the average speed of 6mm after the circuit breaker contact is just opened;
- 平均合闸速度是指断路器触头全开距平均速度;
The average closing speed refers to full clearance average speed of the circuit breaker contact;
- 当额定短路开断电流 < 40kA时, θ = 0.3s; 当额定短路开断电流 ≥ 40kA时, θ = 180s。
When the rated short-circuit breaking current is < 40kA, θ = 0.3s, when the rated short-circuit breaking current is ≥ 40kA, θ = 180s.

储能电机技术参数

Energy Storing Motor

型号 Model	额定电压 (V) Rated voltage	额定输入功率 (W) Rated power input	正常工作电压范围 The range of normal working voltage	额定电压下的储能时间 (S) Energy storage time under rated voltage
ZYJ55-1	DC110V	70, 100	85% ~ 110% 额定电压 85% ~ 110% Rated voltage	≤ 15
	DC220V			

合、分闸电磁铁及相关电气元件技术参数

Technical Parameters of the Closing and Opening Electromagnet and Related Components

项目 Item	合闸电磁铁 Closing electromagnet		分闸电磁铁 Opening electromagnet		闭锁电磁铁 Latching electromagnet		防跳继电器 Anti-trip relay	
	类别 Category	额定电压 (V) Rated operational voltage	类别 Category	额定电压 (V) Rated operational voltage	类别 Category	额定电压 (V) Rated operational voltage	类别 Category	额定电压 (V) Rated operational voltage
额定工作电压 (V) Rated operational voltage	DC220	DC110	DC220	DC110	DC220	DC110	DC220	DC110
额定工作电流 (A) Rated operational current	1.1	2.2	1.1	2.2	25 mA		9.1 mA	
额定电功率 (W) Electrical rating	242	242	242	242	2.7		1.0	
正常工作电压范围 The range of normal working voltage	85% ~ 110% 额定电压 85% ~ 110% rated voltage		65% ~ 120% 额定电压低于 30% 额定电压时, 开关不能分闸 When the 65% ~ 120% rated voltage is less than 30% rated voltage, the switch cannot be opened.		-		-	

二次控制回路方案组合

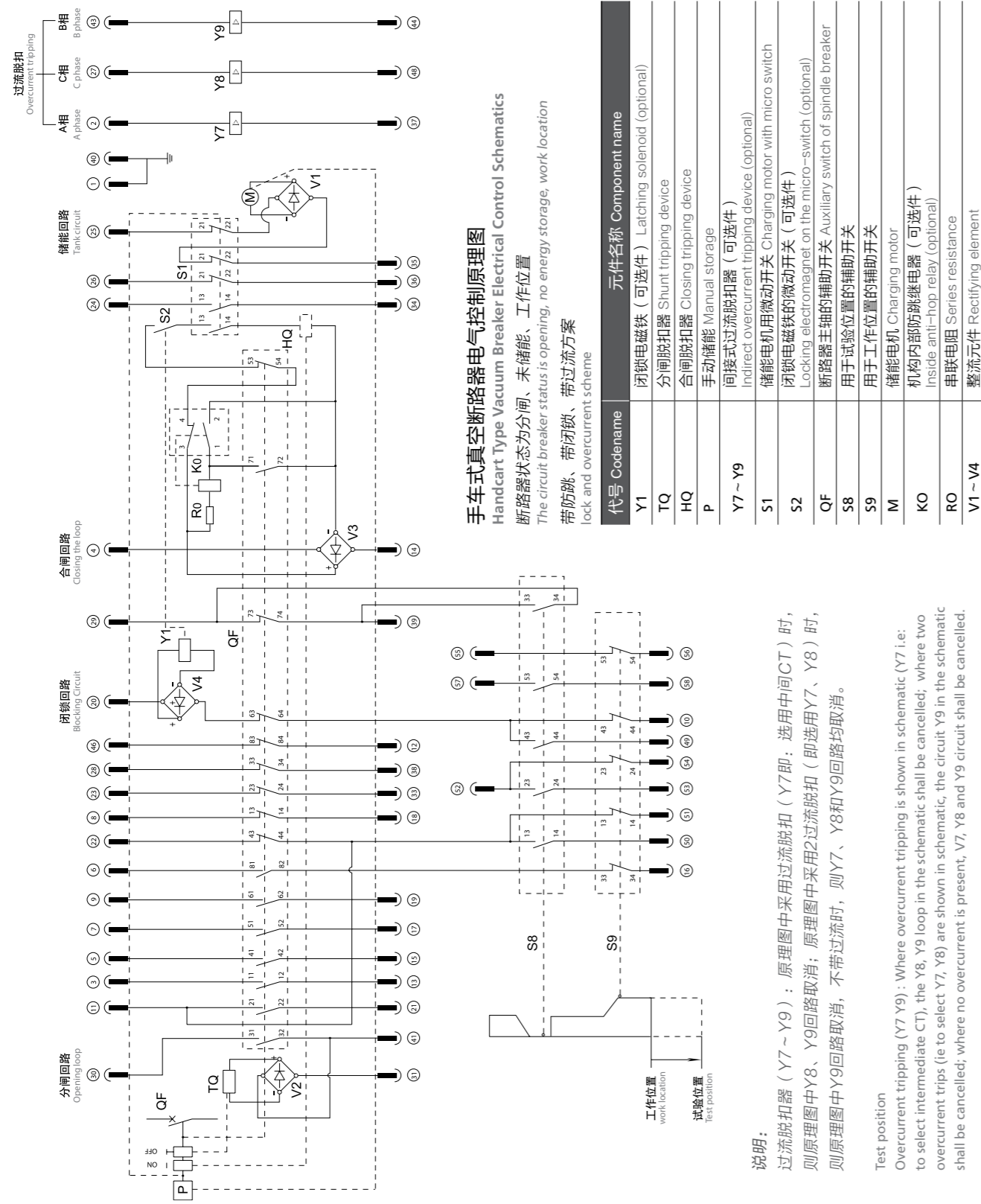
Scheme of the Double-control Circuit

控制电压 Control voltage	闭锁方案 Blocking scheme	防跳方案 Anti-trip scheme	欠压脱扣方案 Undervoltage tripping scheme	过流脱扣方案 Overcurrent tripping scheme		
AC 220V	带电气闭锁 With electric blocking	带防跳继电器 With anti-trip relay	带欠压脱扣 With undervoltage tripper	带过流脱扣器 With overcurrent tripper	过流脱扣器数量 Quantity of overcurrent trippers	动作电流值 Action current value
DC 220V					2过流 / 3过流 2 overcurrent / 3 overcurrent	3.5 / 5 / 7.5 / 10
AC 110V	不带电气闭锁 Without electric blocking	不带防跳继电器 Without anti-trip relay	不带欠压脱扣 Without undervoltage tripper	不带过流脱扣器 Without overcurrent tripper		
DC 110V						

MVG2/MVG4

高压真空断路器（手车式）电气原理图

Electrical Schematic Diagram of HV Vacuum Circuit Breaker (Handcart-Type)



手车式真空断路器电气控制原理图

Handcart Type Vacuum Breaker Electrical Control Schematics

断路器状态为分闸、未储能、工作位置

The circuit breaker status is opening, no energy storage, work location

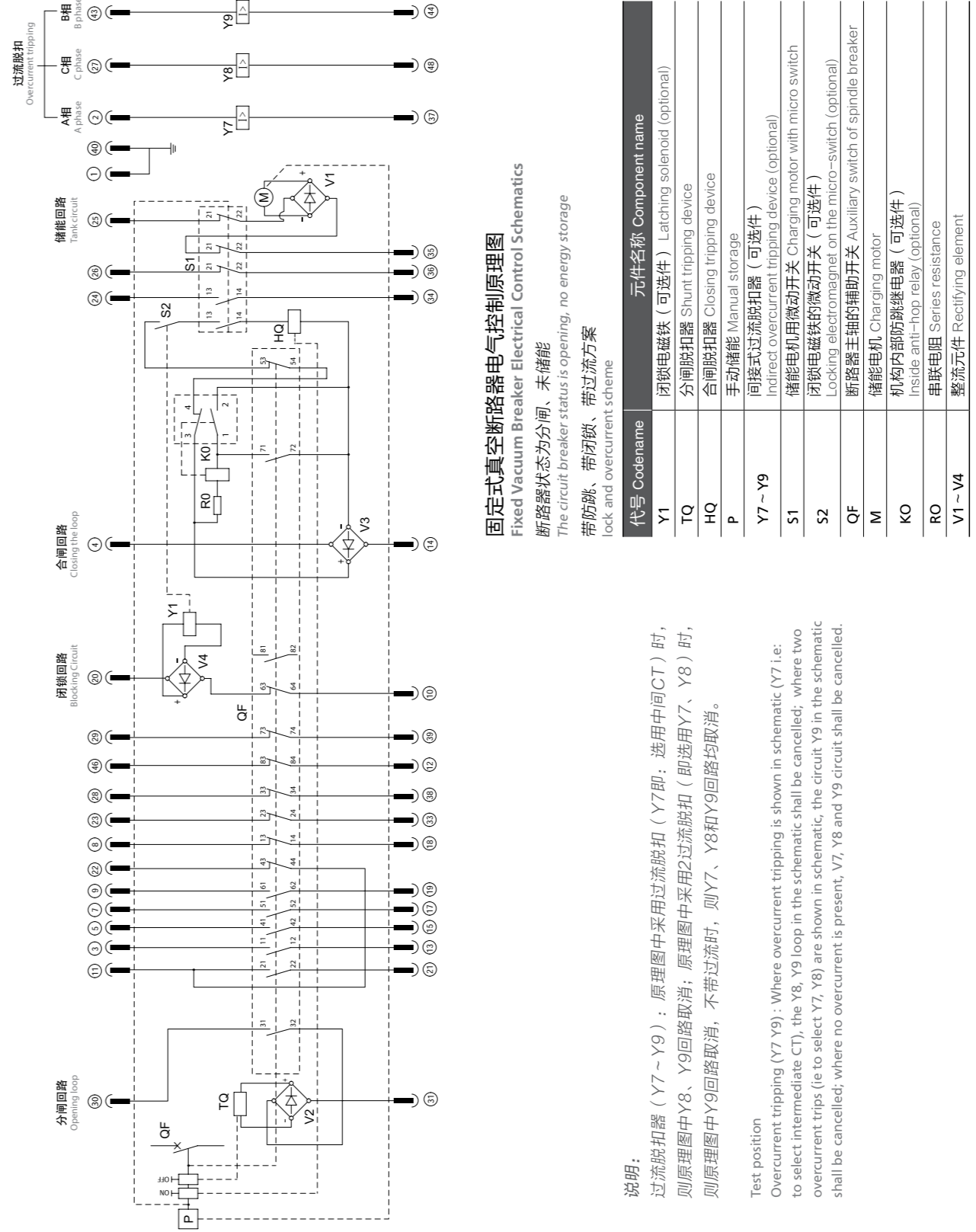
带防跳、带闭锁、带过流方案

lock and overcurrent scheme

MVG2/MVG4

高压真空断路器（固定式）电气原理图

Electrical Schematic Diagram of HV Vacuum Circuit Breaker (Fixed-Type)



固定式真空断路器电气控制原理图

Fixed Vacuum Breaker Electrical Control Schematics

断路器状态为分闸、未储能

The circuit breaker status is opening, no energy storage

带防跳、带闭锁、带过流方案

lock and overcurrent scheme

产品概述

Overview

技术特点

Technical Features

- 主导回路采用固体绝缘筒的结构形式；
- 超长使用寿命，高度可靠的模块化弹簧操作机构；
- 满足智能电网对开关元件的功能要求，主动管理运行风险；
- 完全满足GB1984、DL/T403、IEC62271-100、VDE0670及其他先进工业化国家的标准规范要求。
- Structural type of solid insulating cylinder adopted by the main circuit.
- Ultra-long service life, and highly reliable modular spring operating mechanism;
- Meet the functional requirement for the switch element by the intelligent grid, and manage operation risks actively;
- Fully meet the requirements of GB1984, DL/T403, IEC62271-100, VDE0670 and standards and codes of other advanced industrialized countries.

试验

Test

MVG4-12型高压真空断路器已通过了以下的各种试验，可以确保其在正常使用条件下安全运行。

- 型式试验：工频耐压、雷电冲击耐压、温升、短时和峰值耐受电流、短路电流开合能力及电缆充电电流开合试验。
- 出厂试验：机械特性测试、主回路工频耐压试验、辅助和控制回路绝缘性能试验、主回路电阻测试、联锁操作试验、机械和电气操作试验。

MVG4-12 HV vacuum circuit breaker passed following tests, to ensure safe operation under normal operating conditions.

- Type test: power frequency withstand voltage, lightning impulse withstand voltage, temperature rise, short-duration and peak value withstand voltage, short circuit current switching capability and cable charging current switching test.
- Delivery test: mechanical characteristic test, main circuit power frequency withstand voltage test, auxiliary and control circuit insulation performance test, main circuit resistance test, interlocked operation test, mechanical and electrical operation test.

功能配置及解决方案

Functional Configuration and Solutions

- MVG4套筒式高压真空断路器
- MVG4 enclosed type HV vacuum circuit breaker

应用场合

Applications

- MVG4-12型高压真空断路器可广泛用于电网、电厂、冶金、石化、城市基础设施建设如机场、楼宇、地铁等项目；
- MVG4-12型高压真空断路器在配电系统中，可适用于控制和保护电缆、架空线、变压器、电动机、发电机和电容器组。
- MVG4-12 HV vacuum circuit breaker can be extensively applied to the grid, power plant, metallurgy, petrochemical, urban infrastructure construction, such as airport, buildings, subway, etc.
- In the power distribution system, MVG4-12 HV vacuum circuit breaker can be applicable to control and protective cable, overhead line, transformer, motor, generator and capacitor bank.

安全运行

Safe Operation

MVG4-12型高压真空断路器拥有完善的机械和电气联锁装置，配合适当的开关柜可完成安全的配电功能，同时可确保操作者及设备的安全。

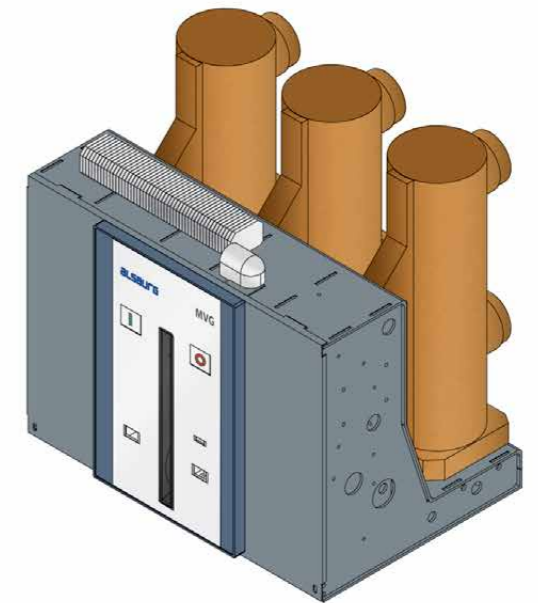
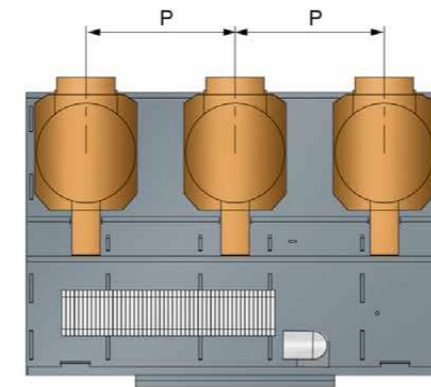
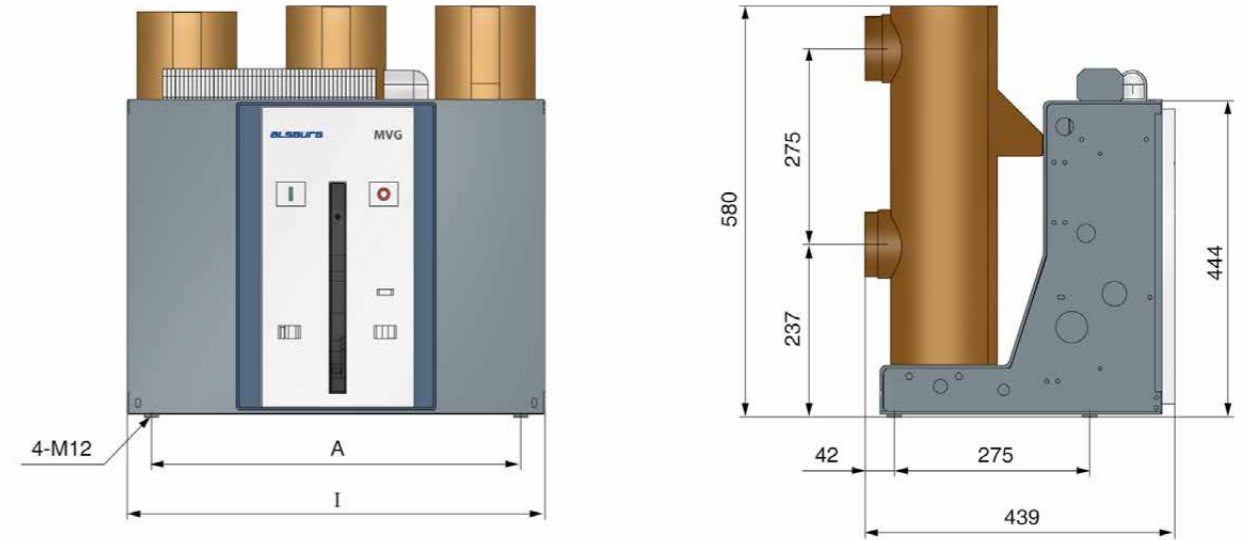
MVG4-12 HV vacuum circuit breaker has complete mechanical and electrical interlocking device. Working with appropriate switch cabinet, it can perform safety power distribution function, while ensuring safety of the operators and equipment.



MVG4

套筒式高压真空断路器（小电流固定式 相间距210）外形尺寸

Outline Dimension of Sleeve Type HV Vacuum Circuit Breaker (Low Current Fixed-Type, With a Phase Spacing of 210)



额定电流 (A) Rated current	额定短路开断电流 (kA) Rated short-circuit breaking current	P (mm)	A (mm)	I (mm)	配套柜宽 (mm) Supporting cabinet width
630 ~ 1250	20...*50	150	410	460	650
630 ~ 1600		210	520	588	800
		275	720	770	1000

1.主回路采用套筒式

Main circuit is of sleeve type

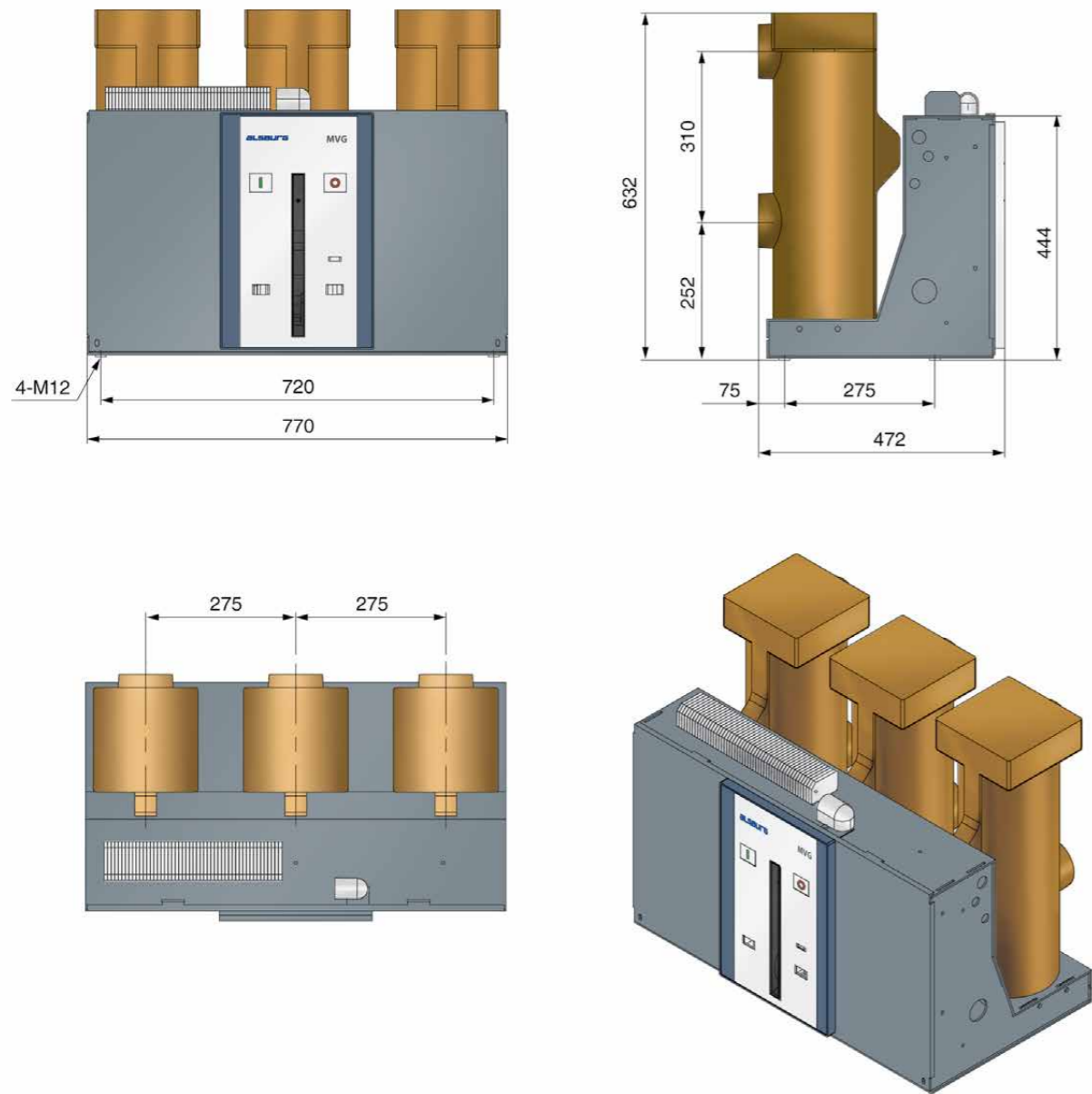
2.*此规格为特殊型号，订货前请与本司技术人员联系

*This specification is the special model, please contact our technical personnel before placing orders

MVG4

套筒式高压真空断路器（大电流固定式 相间距275）外形尺寸

Outline Dimension of Sleeve Type HV Vacuum Circuit Breaker
(High Current Fixed-Type, With a Phase Spacing of 275)



额定电流 (A) Rated current	额定短路开断电流 (kA) Rated short-circuit breaking current
1600 ~ 4000	31.5... *50
*5000	50

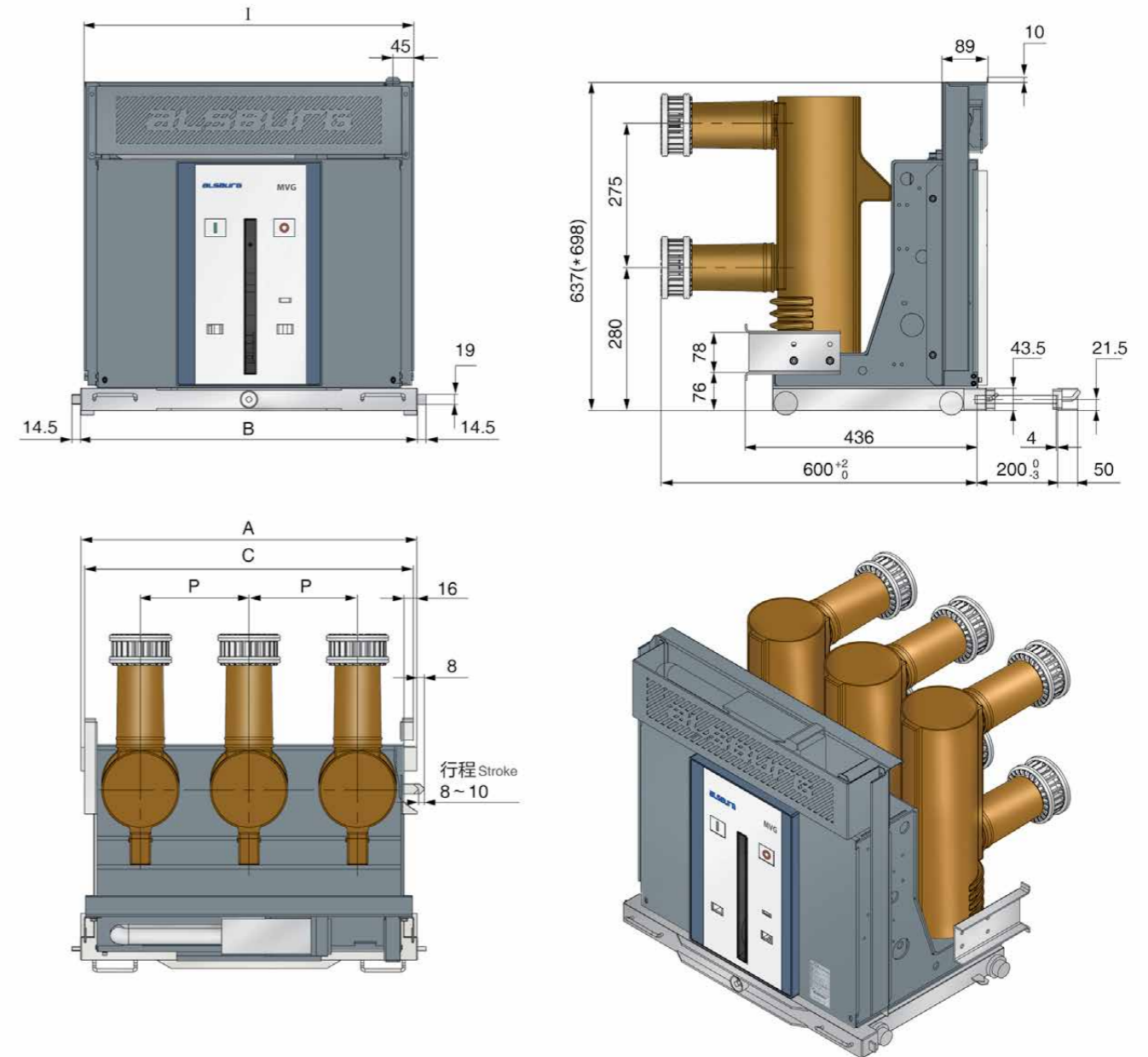
1. 主回路采用套筒式
Main circuit is of sleeve type

2. *此规格为特殊型号，订货前请与本司技术人员联系
*This specification is the special model, please contact our technical personnel before placing orders

MVG4

套筒式高压真空断路器（小电流手车式 相间距210）外形尺寸

Outline Dimension of Sleeve Type HV Vacuum Circuit Breaker



额定电流 (A) Rated current	额定短路开断电流 (kA) Rated short-circuit breaking current	P (mm)	A (mm)	B (mm)	C (mm)	I (mm)	配套柜宽 (mm) Supporting cabinet width	动静触头配合尺寸 Fit dimension of dynamic and static contacts	额定电流 (A) Rated current	梅花触头 Tulip contact	静触头尺寸 Static contact dimension
630 ~ 1250	20... *50	150	502	503	492	492	650	dimension of dynamic and static contacts	630	CT-24	Ø35
630 ~ 1600		210	650	653	640	638	800		1250	CT-30	Ø49
		275	850	853	838	842	1000		1600	CT-36	Ø55

1. 主回路采用套筒式
Main circuit is of sleeve type

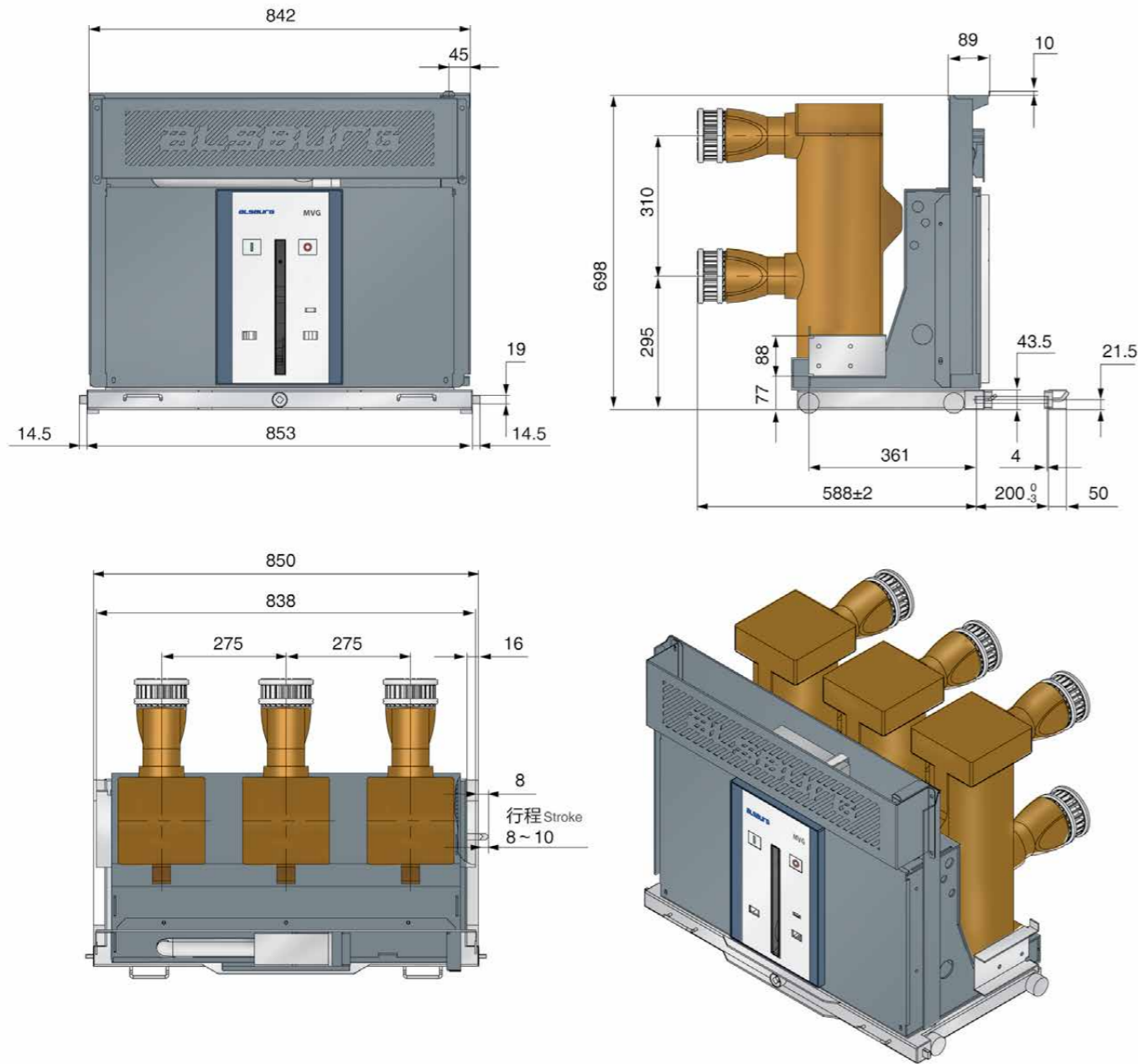
2. 图示中 (*698) 为相间距275的封板的高度的可选方案
(*698) in the drawing is the alternative of the sealing plate height with the phase spacing 275

3. *此规格为特殊型号，订货前请与本司技术人员联系
*This specification is the special model, please contact our technical personnel before placing orders

MVG4

套筒式高压真空断路器（大电流手车式 相间距275）外形尺寸

Outline Dimension of Sleeve Type HV Vacuum Circuit Breaker
(High Current Handcart-Type, With a Phase Spacing of 275)



额定电流 (A) Rated current	额定短路开断电流(kA) Rated short-circuit breaking current	配套柜宽 (mm) Supporting cabinet width	动静触头配合尺寸 Fit dimension of dynamic and static contacts	额定电流 (A) Rated current	梅花触头 Tulip contact	静触头尺寸 Static contact dimension
1600 ~ 4000	31.5...*50	1000	Φ 79	1600 ~ 2000	CT-48	Φ 79
				2500 ~ 3150	CT-64	
*5000	50	1000		4000 ~ 5000	CT-82	

1. 主回路采用套筒式
Main circuit is of sleeve type

2. *此规格为特殊型号，订货前请与本公司技术人员联系

*This specification is the special model, please contact our technical personnel before placing orders

MVG4

套筒式高压真空断路器 主要技术参数

Sleeve Type HV Vacuum Circuit Breaker Main Technical Parameters

项目 Item	单位 Unit	技术数据 Technical data				
额定电压 Rated voltage	kV	12				
额定绝缘水平 Rated insulation level	额定短时工频耐受电压 (1min) Rated power-frequency short-duration withstand voltage(1min)	kV	42			
	额定雷电冲击耐受电压 (峰值) Rated lightning impulse withstand voltage (peak value)	kV	75			
额定频率 Rated frequency	Hz	50				
额定电流 Rated current	A	630	630	1250	1250	
		1250	1250	1600	1600	
				2000	2000	
				2500	2500	3150
				3150	3150	4000
				4000	4000	5000
额定短路开断电流 Rated short-circuit breaking current	kA	20	25	31.5	40	50
额定短时耐受电流 Rated short-time withstand current	kA	20	25	31.5	40	50
额定峰值耐受电流 Rated peak withstand current	kA	50	63	80	100	125
额定短路关合电流 (峰值) Rated short-circuit making current (peak value)	kA	50	63	80	100	125
4s热稳定电流 4s thermal stability current	kA	20	25	31.5	40	50
额定动稳定电流 Rated dynamic current	kA	50	63	80	100	125
额定电容器组关合涌流 Rated capacitor bank inrush making current	kA	12.5 (频率不大于1000Hz/frequency not more than 1000Hz)				
额定单个/背对背电容器组开断电流 Rated single/back-to-back capacitor bank breaking current	A	630 / 400				
额定短路持续时间 Rated duration of short-circuit	s	4				
二次回路工频耐受电压 Power-frequency withstand voltage of secondary circuit	V	2000				
额定操作电压 Rated operational voltage	合闸线圈 Closing coil	V	AC 110 / 220 DC 110 / 220			
	分闸线圈 Opening coil	V	AC 110 / 220 DC 110 / 220			
	储能电机 Energy-storage motor	V	AC 110 / 220 DC 110 / 220			
分闸时间 (额定电压) Opening time (rated voltage)	ms	20 ~ 50				
合闸时间 (额定电压) Closing time (rated voltage)	ms	30 ~ 70				
动、静触头允许磨损累计厚度 Permit abrasion total thickness of dynamic and static contacts	mm	3				
储能时间 Energy storage time	s	≤15				
触头开距 Clearance between open contacts	mm	11 ± 1				
接触行程 Contacting travel	mm	3 ~ 4				
触头合闸弹跳时间 Jump time of contact close brake	ms	≤ 2				
三相分、合闸不同期性 Three-phase opening, closing non-synchronism	ms	≤ 2				
平均分闸速度 ¹ Average opening speed ¹	m/s	0.9 ~ 1.3				
平均合闸速度 ² Average closing speed ²	m/s	0.4 ~ 0.8				
触头分闸反弹幅值 Contact opening rebound amplitude	mm	≤ 2				
主导回路电阻 Main galvanic circle resistance	μΩ	≤ 55 (630A)				
		≤ 45 (1250A)				
		≤ 35 (1600A ~ 2000A)				
		≤ 25 (2500A以上 / above 2500A)				
触头合闸接触压力 Contact closing rebound amplitude	N	2000 ± 200 (20kA)				
		2400 ± 200 (25kA)				
		3100 ± 200 (31.5kA)				
		4750 ± 200 (40kA)				
额定操作顺序 ³ Rated operating sequence ³		分 Opening-θ-合分 Closing opening -180s-合分 Closing opening				
机械寿命 Mechanical life	次	50000 (31.5kA及以下 / 31.5kA and below)				
		20000 (40kA及以上 / 40kA and above)				

1. 平均分闸速度是指断路器触头刚分后6mm的平均速度;

The average opening speed refers to the average speed of 6mm after the circuit breaker contact is just opened;

2. 平均合闸速度是指断路器触头全开距平均速度;

The average closing speed refers to full clearance average speed of the circuit breaker contact;

3. 当额定短路开断电流 < 40kA时, θ=0.3s; 当额定短路开断电流 ≥ 40kA时, θ=180s。

When the rated short-circuit breaking current is < 40kA, θ=0.3s, when the rated short-circuit breaking current is ≥ 40kA, θ=180s.

储能电机技术参数
Energy Storing Motor

型号 Model	额定电压 (V) Rated voltage	额定输入功率 (W) Rated power input	正常工作电压范围 The range of normal working voltage	额定电压下的储能时间 (s) Energy storage time under rated voltage
ZYJ55-1	DC110V	70, 100	85% ~ 110% 额定电压 85% ~ 110% Rated voltage	≤ 15
	DC220V			

合、分闸电磁铁及相关电气元件技术参数

Technical Parameters of the Closing and Opening Electromagnet and Related Components

项目 Item	合闸电磁铁 Closing electromagnet		分闸电磁铁 Opening electromagnet		闭锁电磁铁 Latching electromagnet		防跳继电器 Anti-trip relay	
	DC220	DC110	DC220	DC110	DC220	DC110	DC220	DC110
额定工作电压 (V) Rated operational voltage	DC220	DC110	DC220	DC110	DC220	DC110	DC220	DC110
额定工作电流 (A) Rated operational current	1.1	2.2	1.1	2.2	25 mA		9.1 mA	
额定电功率 (W) Electrical rating	242	242	242	242	2.7		1.0	
正常工作电压范围 The range of normal working voltage	85% ~ 110% 额定电压 85% ~ 110% rated voltage		65% ~ 120% 额定电压低于 30% 额定电压时, 开关不能分闸 When the 65% ~ 120% rated voltage is less than 30% rated voltage, the switch cannot be opened.		-		-	

二次控制回路方案组合

Scheme of the Double-control Circuit

控制电压 Control voltage	闭锁方案 Blocking scheme	防跳方案 Anti-trip scheme	欠压脱扣方案 Undervoltage tripping scheme	过流脱扣方案 Overcurrent tripping scheme		
AC 220V	带电气闭锁 With electric blocking	带防跳继电器 With anti-trip relay	带欠压脱扣 With undervoltage tripper	带过流脱扣器 With overcurrent tripper	过流脱扣器数量 Quantity of overcurrent trippers	动作电流值 Action current value
DC 220V					2过流 / 3过流 2 overcurrent / 3 overcurrent	3.5 / 5 / 7.5 / 10
AC 110V	不带电气闭锁 Without electric blocking	不带防跳继电器 Without anti-trip relay	不带欠压脱扣 Without undervoltage tripper	不带过流脱扣器 Without overcurrent tripper		
DC 110V						

Every Detail to
Achieve Excellence

每一细节都力求精益求精!



产品概述 Overview

总则

MVG-12S侧装固定式真空断路器为我公司自主研发的具有行业内竞争力的新一代12kV真空断路器。其主要特征是主导电回路三相纵向布置，整机宽度尺寸小，结构紧凑，固定安装；适用于各类箱式变电站、环网柜和固定式开关柜。

标准

MVG-12S侧装固定式真空断路器完全符合GB1984和中国电力行业标准DL403外，还满足IEC62271-100标准规范以及其他主要工业化国家的相关标准。

试验

MVG-12S侧装固定式真空断路器已经通过了以下的各种试验，可以确保其安全运行。

- **型式试验：**工频耐压、雷电冲击耐压、温升、短时和峰值耐受电流、短路电流开合能力、机械寿命等试验。
- **出厂例行测试：**机械特性测试、主回路工频耐压试验、辅助和控制回路绝缘性能试验、主回路电阻测试、联锁操作试验、机械和电气操作试验。

应用范围

- MVG-12S侧装固定式真空断路器可广泛用于电厂、电网、冶金、石化、城市基础设施建设如机场、楼宇、地铁等项目。
- MVG-12S侧装固定式真空断路器在配电系统中，可适用于控制和保护电缆、架空线、变压器、电动机、发电机和电容器组。

安全运行

MVG-12S侧装固定式真空断路器拥有完善的机械和电气联锁装置，配合适当的开关柜可完成安全的配电功能，确保操作者和设备的安全。

General

Independently developed by our company, MVG-12S series side-mounted fixed type vacuum circuit breaker is a new-generation 12kV vacuum circuit breaker which is industrially competitive. Its main features include three-phase longitudinal arrangement of the main conducting circuit, small size of overall width, compact structure and fixed mounting. It is applicable to various types of box-type substations, ring main units and fixed type switch cabinets.

Standard

MVG-12S side-mounted fixed type vacuum circuit breaker is completely in conformity with GB1984 and Chinese power industry standard DL403, and standard specification IEC62271-100 and other relevant standards of major industrialized countries.

Test

MVG-12S side-mounted fixed type vacuum circuit breaker passed the following tests to ensure its safe operation.

- **Type test:** power frequency withstand voltage, lightning impulse withstand voltage, temperature rise, short-duration and peak value withstand voltage, short-circuit current switching capability, mechanical life and other tests.
- **Delivery routine test:** mechanical characteristics test, main circuit power frequency withstand voltage test, auxiliary and control circuit insulation performance test, main circuit resistance test, interlocked operation test, mechanical and electrical operation test.

Applications

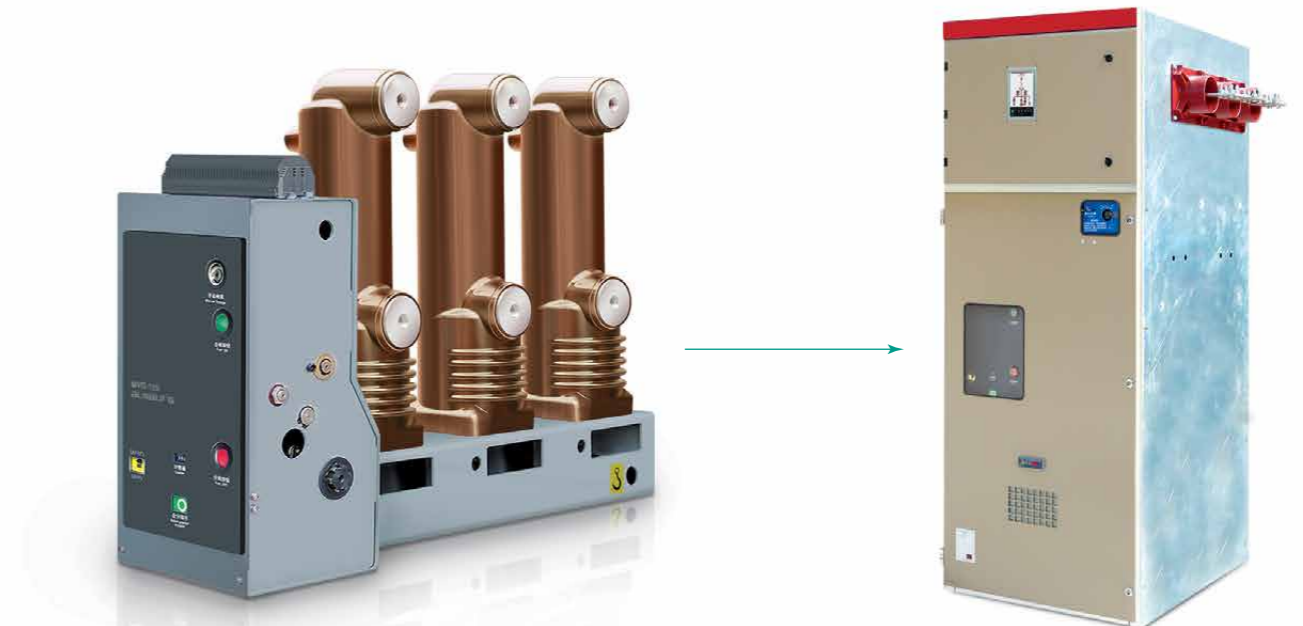
- MVG-12S side-mounted fixed type vacuum circuit breaker can be extensively applied to the power plant, grid, metallurgy, petrochemical, urban infrastructure construction, such as airport, buildings, subway, etc.
- In the power distribution system, MVG-12S side-mounted fixed type vacuum circuit breaker can be applicable to control and protective cable, overhead line, transformer, motor, generator and capacitor bank.

Safe Operation

MVG-12S side-mounted fixed type vacuum circuit breaker has complete mechanical and electrical interlocking device. Working with appropriate switch cabinet, it can perform safety power distribution function, while ensuring safety of the operators and equipment.

断路器各种应用

Various Applications of Circuit Breaker



MVG-12S侧装式高压真空断路器

MVG-12S type side-mounted high voltage vacuum circuit breaker

KGN□-12型户内金属铠装固定式开关设备

KGN□-12 type indoor metal armored fixed type switchgear



环网柜
Ring main unit



箱式变电站
Box-type substation

主要技术参数

Main Technical Parameters

项 目 Item	单位 Unit	技术数据 Technical data		
额定电压 Rated voltage	kV	12		
额定绝缘水平 Rated insulation level	额定短时工频耐受电压 (1min) Rated power-frequency short-duration withstand voltage(1min)	kV	42	
	额定雷电冲击耐受电压 (峰值) Rated lightning impulse withstand voltage (peak value)	kV	75	
额定频率 Rated frequency	Hz	50		
额定电流 Rated current	A	630 1250	630 1250	1250
额定短路开断电流 Rated short-circuit breaking current	kA	20	25	31.5
额定短时耐受电流 Rated short-time withstand current	kA	20	25	31.5
额定峰值耐受电流 Rated peak withstand current	kA	50	63	80
额定短路关合电流 (峰值) Rated short-circuit making current (peak value)	kA	50	63	80
4s热稳定电流 4s thermal stability current	kA	20	25	31.5
额定动稳定电流 Rated dynamic current	kA	50	63	80
额定电容器组关合涌流 Rated capacitor bank inrush making current	kA	12.5 (频率不大于1000Hz/frequency not more than 1000Hz)		
机械寿命 Mechanical life	次	20000		
额定单个/背对背电容器组开断电流 Rated single/back-to-back capacitor bank breaking current	A	630 / 400		
额定短路持续时间 Rated duration of short-circuit	S	4		
二次回路工频耐受电压 Power-frequency withstand voltage of secondary circuit	V	2000		
额定操作电压 Rated operational voltage	合闸线圈 Closing coil	V	AC110 / 220 DC110 / 220	
	分闸线圈 Opening coil	V	AC110 / 220 DC110 / 220	
	储能电机 Energy-storage motor	V	AC110 / 220 DC110 / 220	
分闸时间 (额定电压) Opening time (rated voltage)	ms	20 ~ 50		
合闸时间 (额定电压) Closing time (rated voltage)	ms	30 ~ 70		
动、静触头允许磨损累计厚度 Permit abrasion total thickness of dynamic and static contacts	mm	3		
储能时间 Energy storage time	S	≤15		
触头开距 Clearance between open contacts	套筒式 Sleeve Type	mm	11 ± 1	
	固封式 Solid sealing	mm	9 ± 1	
接触行程 Contacting travel	mm	3 ~ 4		
触头合闸弹跳时间 Jump time of contact close brake	ms	≤2		
三相分、合闸不同期性 Three-phase opening, closing non-synchronism	ms	≤2		
平均分闸速度 ¹ Average opening speed ¹	m/s	0.9 ~ 1.3		
平均合闸速度 ² Average closing speed ²	m/s	0.5 ~ 0.9		
触头分闸反弹幅值 Contact opening rebound amplitude	mm	≤3		
主导回路电阻 Main galvanic circle resistance	μΩ	≤45 (630A) ≤40 (1250A)		
触头合闸接触压力 Contact closing rebound amplitude	N	3100 ± 200(31.5kV)		
额定操作顺序 Rated operating sequence		分Opening-0.3s-合分Closing opening-180s-合分 Closing opening		

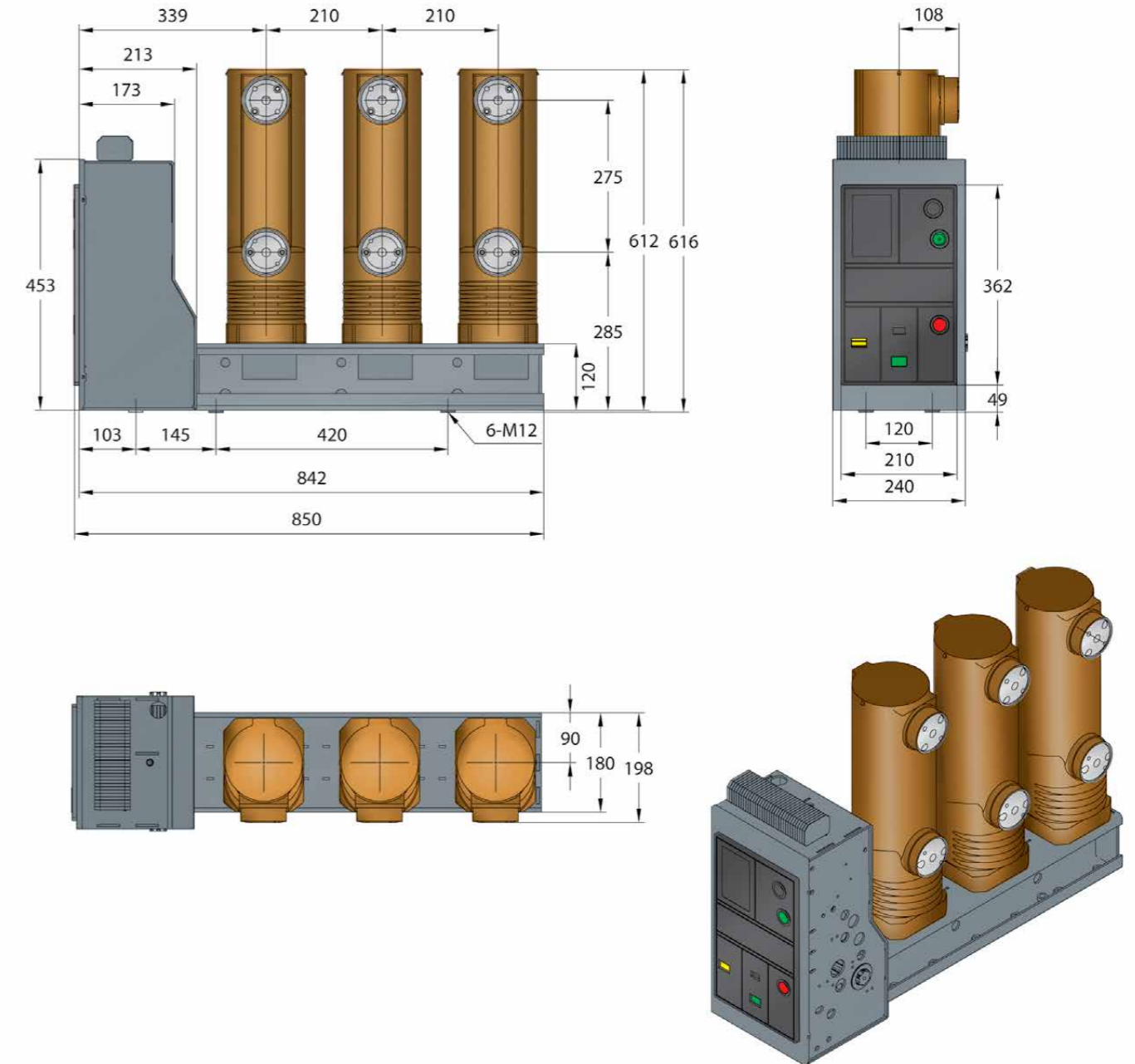
1. 平均分闸速度是指断路器触头刚分后6mm的平均速度;
The average opening speed refers to the average speed of 6mm after the circuit breaker contact is just opened;

2. 平均合闸速度是指断路器触头全开距平均速度。
The average closing speed refers to full clearance average speed of the circuit breaker contact.

MVG-12S (套筒式)

侧装式真空断路器外形尺寸

Outline Dimension of Side-Mounted Vacuum Circuit Breaker

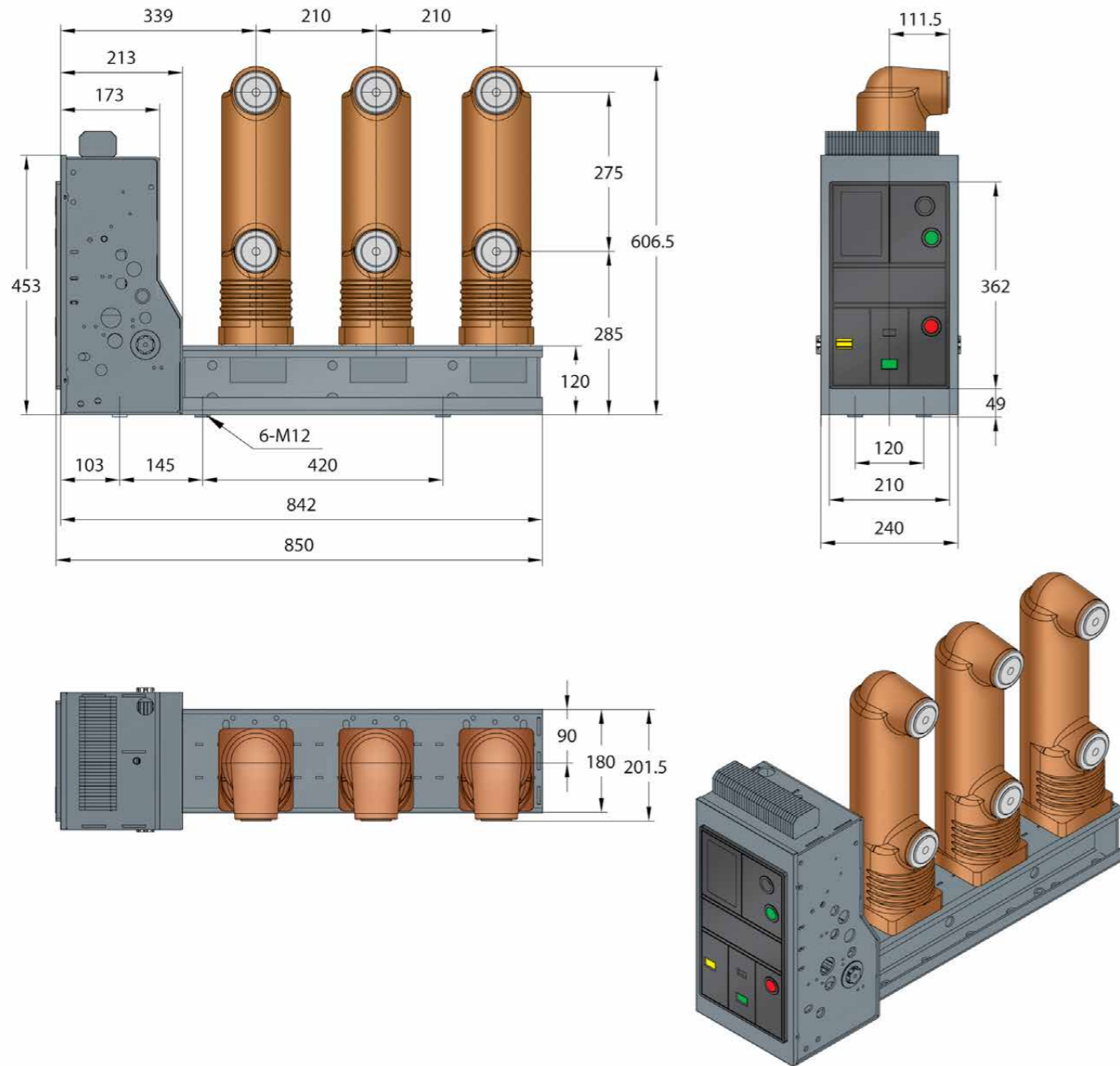


额定电流 (A) Rated current	额定短路开断电流 (kA) Rated short-circuit breaking current	机箱柜宽 (mm) Enclosure width
630 ~ 1250	20...31.5	240

主回路采用套筒式
Main circuit is of sleeve type

MVG-12S (固封式) 侧装式真空断路器外形尺寸

Outline Dimension of Side-Mounted Vacuum Circuit Breaker

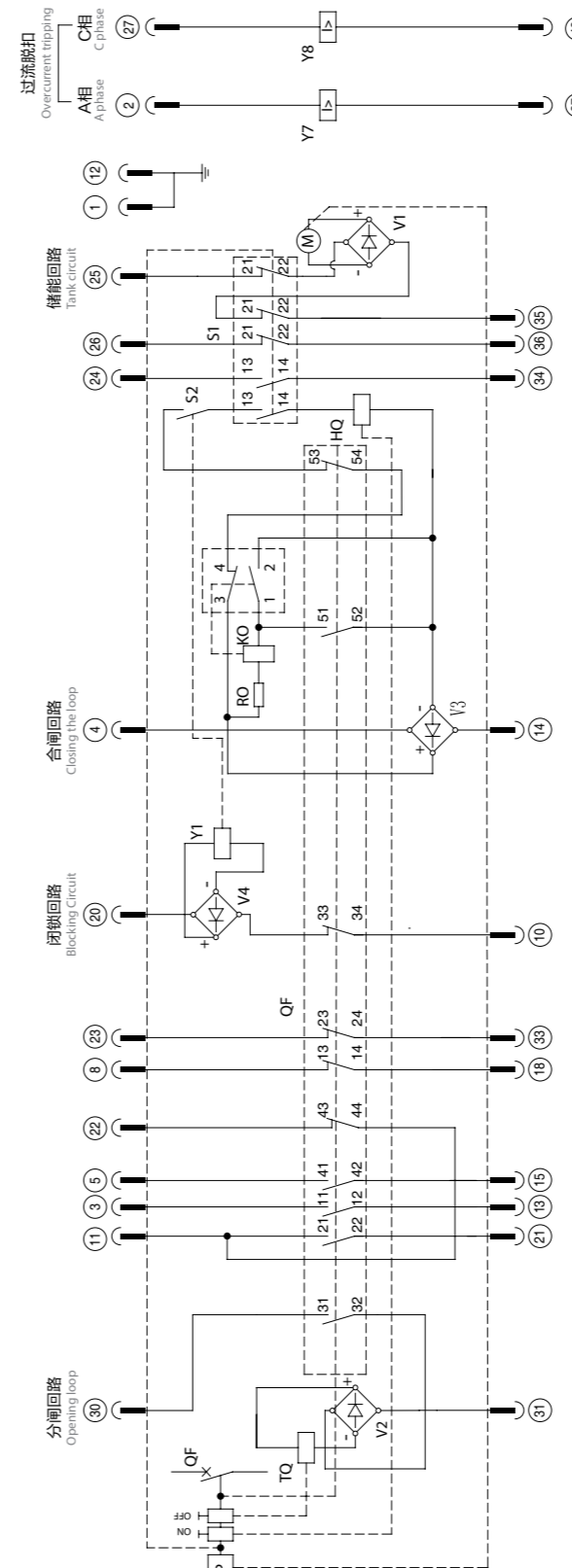


额定电流 (A) Rated current	额定短路开断电流 (kA) Rated short-circuit breaking current	机箱柜宽 (mm) Enclosure width
630 ~ 1250	20...31.5	240

主回路采用固封极柱
Main circuit adopts solid-sealed post terminal

侧装式真空断路器电气原理图

Side-Mounted Vacuum Circuit Breaker Electrical Schematics



真空断路器电气控制原理图
Side-Mounted Vacuum Circuit Breaker Electrical Schematics

断路器状态为分闸、未储能
Breaker status, including separating brake, no energy storage
带防跳、带闭锁、带过流方案
lock and overcurrent scheme

代号 Codename	元件名称 Component name
Y1	闭锁电磁铁 (可选件) Latching solenoid (optional)
TQ	分闸脱扣器 Shunt tripping device
HQ	合闸脱扣器 Closing tripping device
P	手动储能 Manual storage
Y7 ~ Y8	间接式过流脱扣器 (可选件) Indirect overcurrent tripping device (optional)
S1	储能电机用微动开关 Charging motor with micro switch
S2	闭锁电磁铁的微动开关 (可选件) Locking electromagnet on the micro-switch (optional)
QF	断路器主轴的辅助开关 Auxiliary switch of spindle breaker
M	储能电机 Charging motor
KO	机构内部防跳继电器 (可选件) Inside anti-hop relay (optional)
RO	串联电阻 Series resistance
V1 ~ V4	整流元件 Rectifying element

产品概述 Overview

总则

MVG-40.5系列高压真空断路器为我公司自主研发的具有行业内竞争力的新一代40.5kV真空断路器。其主要特征是主导电回路安装在全封闭的三相绝缘筒内，操动机构与主导电回路前后布置。操动机构为新型弹簧操动机构，该机构为我公司自主研发，结构简单、动作可靠。

标准

MVG-40.5系列高压真空断路器各项技术参数完全符合GB1984、GB/T11022和中国电力行业标准DL403，同时还满足IEC62271-100、IEC56标准规范以及其他主要工业化国家相关标准的规定。

试验

MVG-40.5系列高压真空断路器已经通过了以下的各种试验，可以确保其安全运行。

- **型式试验：**工频耐压、雷电冲击耐压、温升、短时和峰值耐受电流、短路电流开合能力、机械寿命等试验。
- **出厂例行测试：**机械特性测试、主回路工频耐压试验、辅助和控制回路绝缘性能试验、主回路电阻测试、联锁操作试验、机械和电气操作试验。

应用范围

- MVG-40.5系列高压真空断路器可广泛用于电厂、电网、冶金、石化、城市基础设施建设如机场、楼宇、地铁等项目。
- MVG-40.5系列高压真空断路器在配电系统中，可适用于控制和保护电缆、架空线、变压器、电动机、发电机和电容器组。

安全运行

MVG-40.5系列高压真空断路器拥有完善的机械和电气联锁装置，配合相适应的开关柜可完成安全的配电功能，确保操作者和设备的安全。

General

Independently developed by our company, MVG-40.5 series HV vacuum circuit breaker is a new-generation 40.5kV vacuum circuit breaker which is industrially competitive; its main features are that the main conducting circuit is installed in the totally-enclosed three-phase insulating cylinder, and the actuating mechanism and main conducting circuit are in front and back arrangement. The actuating mechanism is the new type spring actuator which is researched and developed by our company, with simple structure and reliable actuation.

Standard

Various technical parameters of the MVG-40.5 series high-voltage vacuum circuit breaker are completely in conformity with GB1984, GB/T11022 and Chinese power industry standard DL403, and standard specification IEC62271-100, IEC56 and other relevant standards of major industrialized countries.

Test

MVG-40.5 series high-voltage vacuum circuit breaker passed the following tests to ensure its safe operation.

- **Type test:** power frequency withstand voltage, lightning impulse withstand voltage, temperature rise, short-duration and peak value withstand voltage, short-circuit current switching capability, mechanical life and other tests.
- **Delivery routine test:** mechanical characteristics test, main circuit power frequency withstand voltage test, auxiliary and control circuit insulation performance test, main circuit resistance test, interlocked operation test, mechanical and electrical operation test.

Applications

- MVG-40.5 series high-voltage vacuum circuit breaker can be extensively applied to the power plant, grid, metallurgy, petrochemical, urban infrastructure construction, such as airport, buildings, subway, etc.
- In the power distribution system, MVG-40.5 series high-voltage vacuum circuit breaker can be applicable to control and protective cable, overhead line, transformer, motor, generator and capacitor bank.

Safe Operation

MVG-40.5 HV vacuum circuit breaker has complete mechanical and electrical interlocking device. Working with appropriate switch cabinet, it can perform safety power distribution function, while ensuring safety of the operators and equipment.



**Every Detail to
Achieve Excellence**
每一细节都力求精益求精!

MVG-40.5系列高压真空断路器技术特点

Technical Features of MVG-40.5 Series HV Vacuum Circuit Breaker

断路器结构采用整体型布局

弹簧操动机构与断路器本体部分采用一体化结构设计。一次主导电回路与机构采用上、下布局的形式，主导电回路部分位于机构上部，弹簧操动机构及手车推进机构位于断路器的下部，结构紧凑、布局合理。

Breaker adopts overall type layout structure

The spring operating mechanism and the main part of the circuit breaker adopts the integrated design structure. Primary electrical circuit and mechanism adopts the up-down layout. Primary electrical circuit section is located in the upper body. The spring operating mechanism and handcart-driving mechanism are in the lower part of the circuit breaker, all representing compact structure and reasonable layout.

较好的手车互换性和适应性

MVG-40.5系列高压真空断路器的外形尺寸与ZN85-40.5真空断路器完全一致，可实现手车之间的方便互换，从而其适应性强、适用范围广。MVG-40.5断路器手车采用落地式结构设计，不用转运小车，可以方便用户进行现场的检修和定期维护，MVG-40.5系列真空断路器适配柜型为KYN61-40.5高压成套开关柜。

Better hand-cart interchangeability and adaptability

The external dimensions of MVG-40.5 series of high-voltage vacuum circuit breakers are exactly the same as those of the ZN85-40.5 vacuum breakers. It enables easy hand-cart interchange, thereby strengthening the adaptability and enabling wider range of application. MVG40.5 circuit breaker adopts the floor-standing structure. With no requirement of trolley transport in the design, users can easily conduct on-site maintenance and regular maintenance. MVG-40.5 Series vacuum breaker uses KYN61-40.5 High Voltage Switchgear as its storage cabinet.

可靠的一体化弹簧操动机构

MVG-40.5系列高压真空断路器的弹簧操动机构为平面布置的弹簧操动机构，具有手动储能和电动储能功能，操动机构置于灭弧室前的下侧，这种结构设计，不仅可使整机外形尺寸小，而且可使操作机构的操作性能与灭弧室开合所需性能更为吻合，减少了不必要的中间传动环节，降低了能耗和噪声，使其操作性能更为可靠。

MVG-40.5系列高压真空断路器的操动机构主传动结构为成熟的12kV MVG系列操动机构的延伸，主传动的可靠性有上万台的生产、运行经验，断路器的整机动作稳定性、可靠性高。

Reliable integrated spring operating mechanism

The spring operating mechanism of the MVG-40.5 series high-voltage vacuum circuit breaker is a spring operating mechanism with plane layout, which has both manual storage and electric energy storage functions and the operating mechanism, is placed under the front side of the arc chamber. Such a design not only can reduce the overall size but also make the performance of the operating mechanism more consistent with the desired properties for the interrupter chamber. As a result, such design may reduce unnecessary intermediate transmission links and reduce energy consumption and noise, making the operations more reliable.

Main transmission structure of the operating mechanism in MVG-40.5 series of high-voltage vacuum circuit breaker is the extension of the already matured 12kV MVG series operating mechanism. With production and operating experience through tens of thousands of units, the operation of the circuit breaker is highly stable and reliable.



主导电回路采用套筒式或固封式结构

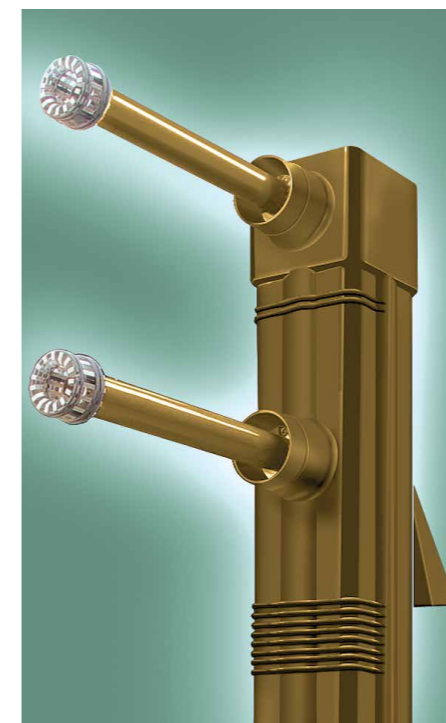
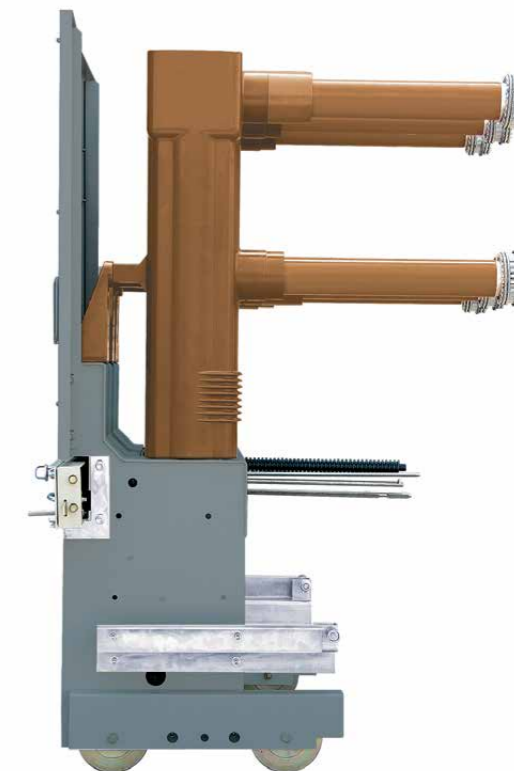
MVG-40.5系列高压真空断路器的主导电回路有套筒式和固封式两种结构形式可供用户根据不同的使用场所进行方便地选择。

套筒式结构：断路器的一次主导电回路的真空灭弧室布置在封闭的绝缘筒内，绝缘筒选用机电性能可靠的环氧树脂材料，并采用先进APG的工艺成型，该绝缘筒既起安装支撑作用，又起相间、相对地绝缘作用。该绝缘筒的设计充分考虑了国家标准及严酷工作条件的使用要求，不仅可以防止真空灭弧室不受外界环境的影响，防止灰尘和异物进入主回路的部分，而且可以确保即使在湿热及严重污秽的环境下，也可以对电压效应呈现出高阻态。

Primary electrical circuit adopts sleeve-type or solid sealing structure

Primary electrical circuit of MVG-40.5 series high-voltage vacuum circuit breaker adopts both sleeve-type and solid sealing structure to facilitate the selection of users depending on premises of usage.

Sleeve-type structure. The vacuum interrupter of the Circuit Breaker's 1st primary electrical circuit is located in a closed insulating cylinder, which is made of epoxy resin material with reliable mechanical and electrical performance and by using advanced APG molding technology. The insulating cylinder can support the installation and have the effect of interphase and relative insulation. The design of the insulating cylinder takes full account of the national standards and the use requirements under harsh working conditions, for not only protecting the vacuum chamber from the impact of the external environment, but also preventing dust and foreign matters from entering the main circuit section as well as ensuring that there will be high impedance state against the voltage effect even in hot and humid environment with severe contaminations.

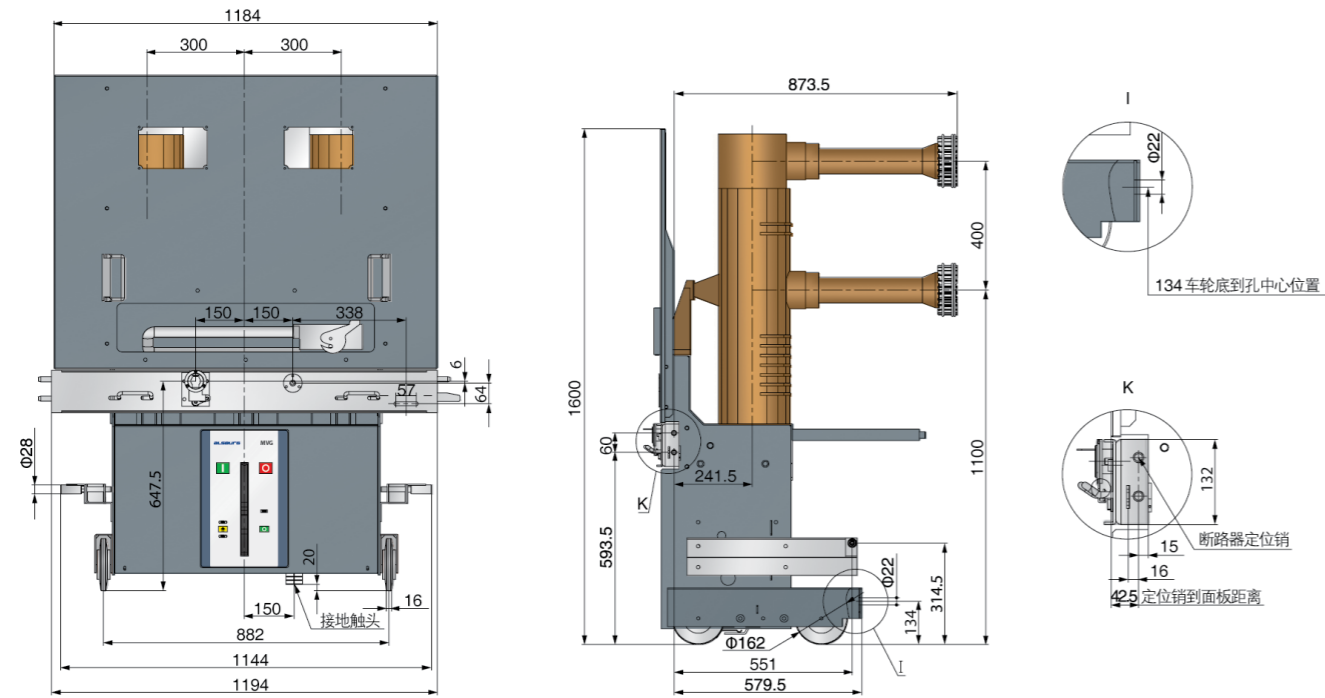


固封式结构：断路器的一次导电回路采用固体绝缘技术的固封极柱，该固封极柱通过先进的自动压力凝胶APG工艺将真空灭弧室和一次导电回路的其它零件直接固封在特种环氧树脂材料里，形成一个主导电回路模块。固封极柱安装端进行了内外双裙边的设计，该极柱具有大爬电比距、高机械强度、高零部件精度、零部件数量少、无需二次调整、搭接面少的特点。极柱电场分布均匀，避免了局部电场集中对有机绝缘的破坏。同时采用此种结构设计，可大大地简化一次主导电回路的装配工艺，彻底避免了主导电回路连接螺栓由于运行中的振动而松动的问题，保证了主导电回路电联结的高可靠性，使断路器的一次主导电回路的实现免维护成为可能。

Solid sealing structure: The 1st conductive loop of the circuit breaker uses solid seal pole with solid insulating technology. The solid seal pole adopts advanced automatic pressure APG sectional glue processes to have other parts of the vacuum interrupter and 1st conductive loop directly enclosed in specialty bad epoxy resin material in special epoxy resin materials to form a primary electrical circuit module. The mounting end of the solid seal pole adopts double skirt design (inside and outside) and the seal pole has features such as long leakage distance, high mechanical strength, high precision parts, smaller number of parts, no secondary adjustment, smaller overlapping surface and so on. The electric field of the pole is evenly distributed, which may avoid destruction of the organic insulating by concentration of local electric field. At the same time such a structure design can greatly simplify the assembly process of the 1st primary electrical circuit, thereby completely avoiding loosening of the bolts connecting the primary electrical circuit due to operational vibration, which ensures the high reliability in the electrical coupling of the primary electrical circuit, making possible the maintenance-free operation of the 1st primary electrical circuit breaker.

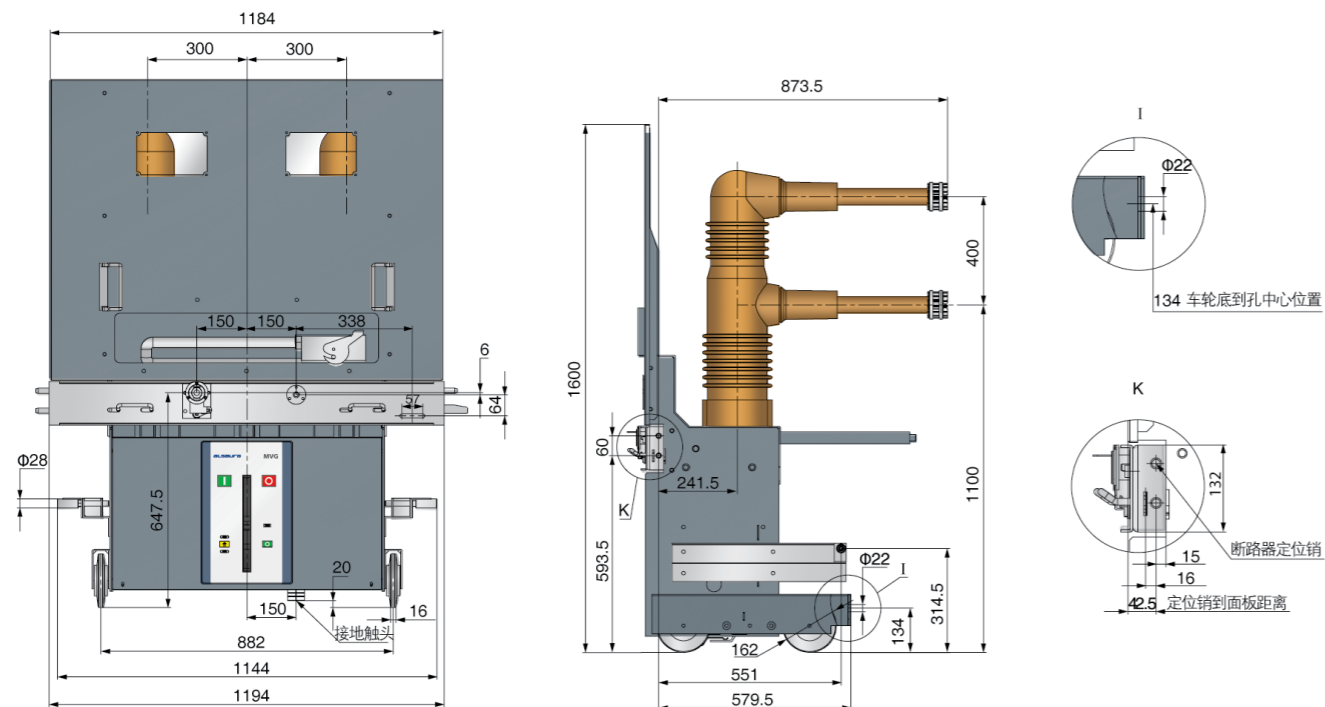
MVG-40.5 套筒式高压真空断路器外形尺寸

Outline Dimension of Sleeve Type HV Vacuum Circuit Breaker



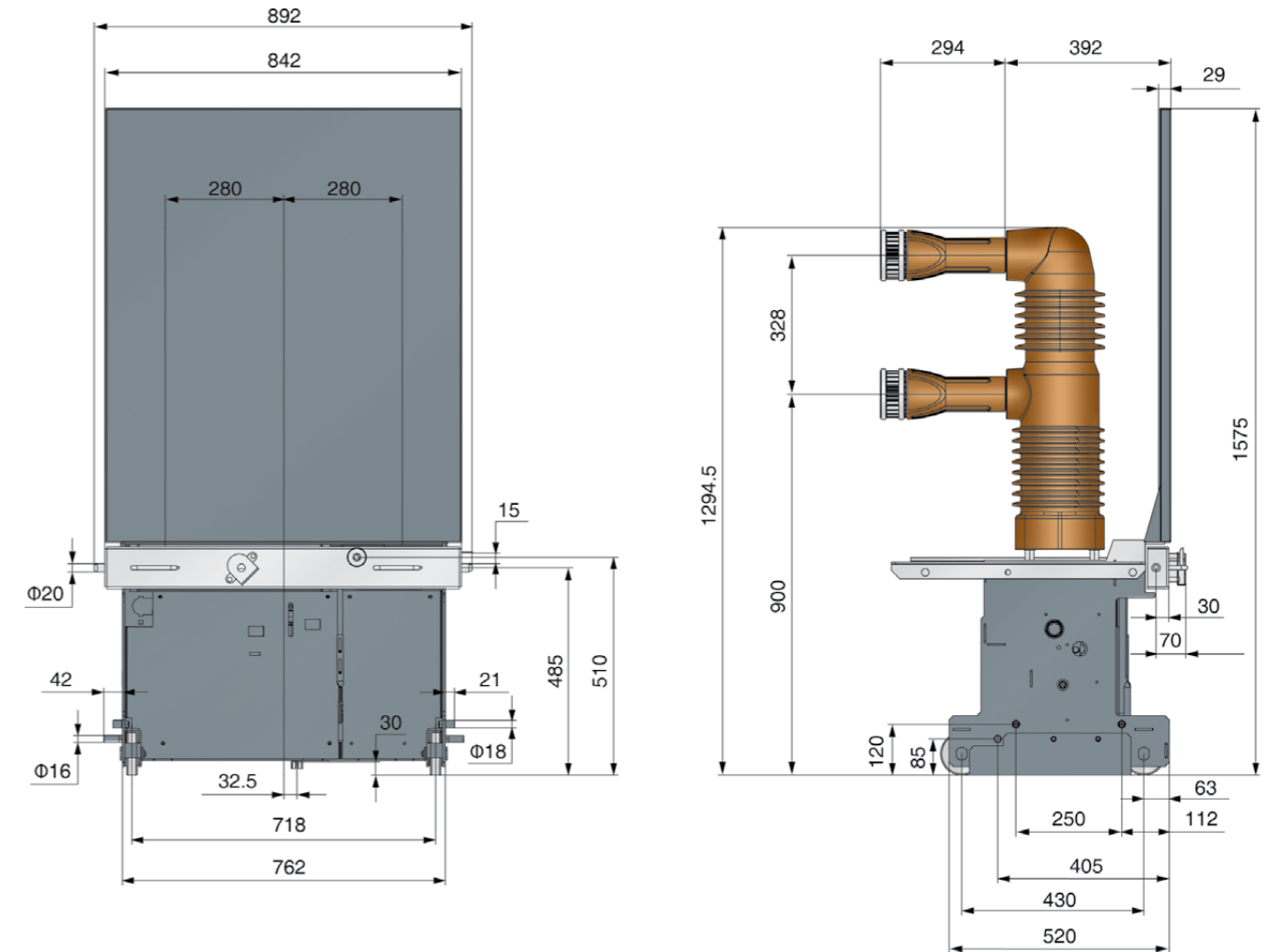
MVG-40.5 固封式高压真空断路器外形尺寸

Outline Dimension of Enclosed Type HV Vacuum Circuit Breaker



MVG-40.5 固封式高压真空断路器外形尺寸

Outline Dimension of Enclosed Type HV Vacuum Circuit Breaker



额定电流 (A) Rated current	额定短路开断电流 (kA) Rated short-circuit breaking current	梅花触头 Tulip contact	静触头尺寸 (mm) Static contact dimension
630 ~ 1250	31.5	CT-30	$\Phi 49$
1600		CT-36	$\Phi 55$
2000		CT-48	$\Phi 79$
2500 ~ 3150		CT-64	$\Phi 109$

主回路采用固封极柱
Main circuit adopts solid-sealed post terminal

主要技术参数 Main Technical Parameters

项目 Item	单位 Unit	技术数据 Technical data		
额定电压 Rated voltage	kV	40.5		
额定绝缘水平 Rated insulation level	额定短时工频耐受电压 (1min) Rated power-frequency short-duration withstand voltage (1min)	kV	95	
	额定雷电冲击耐受电压 (峰值) Rated lightning impulse withstand voltage (peak value)	kV	185	
额定频率 Rated frequency	Hz	50		
额定电流 Rated current	A	630	630	1250
		1250	1250	1600
				2000
				2500
				3150
额定短路开断电流 Rated short-circuit breaking current	kA	20	25	31.5
额定短时耐受电流 Rated short-time withstand current	kA	20	25	31.5
额定峰值耐受电流 Rated peak withstand current	kA	50	63	80
4s热稳定电流 4s thermal stability current	kA	20	25	31.5
额定动稳定电流 Rated dynamic current	kA	50	63	80
额定短路关合电流 (峰值) Rated short-circuit making current (peak value)	kA	50	63	80
额定短路持续时间 Rated duration of short-circuit	s	4		
机械寿命 Mechanical life	次	10000		
额定电容器组合涌流 Rated capacitor bank inrush making current	kA	12.5 (频率不大于1000Hz/frequency not more than 1000Hz)		
额定单个/背对背电容器组开断电流 Rated single/back-to-back capacitor bank breaking current	A	630 / 400		
短路开断电流开断次数 Breaking times of short-circuit breaking current	次	20		
二次回路工频耐受电压 Power-frequency withstand voltage of secondary circuit	V	2000		
额定操作电压 Rated operational voltage	V	AC110 / 220 DC110 / 220		
额定操作顺序 Rated operating sequence		O-0.3s-CO-180s-CO		
储能时间 Energy storage time	s	≤15		
触头开距 Clearance between open contacts	mm	20 ± 2		
接触行程 Contacting travel	mm	6 ± 1		
相间中心距 Phases center distance	mm	300 ± 1.5 / 280 ± 1.5		
触头合闸弹跳时间 Jump time of contact close brake	ms	≤ 3		
三相分、合闸不同期性 Three-phase opening, closing non-synchronism	ms	≤ 2		
平均分闸速度 ¹ Average opening speed ¹	m/s	1.4 ~ 2.0		
平均合闸速度 ² Average closing speed ²	m/s	0.6 ~ 1.3		
合闸时间 Closing time	ms	30 ~ 70		
分闸时间 Opening time	ms	20 ~ 45		
触头分闸反弹幅值 Contact opening rebound amplitude	mm	≤ 3		
动、静触头允许磨损累计厚度 Permit abrasion total thickness of dynamic and static contacts	mm	3		
主导回路电阻 Main galvanic circle resistance	μΩ	≤ 75	2000A及以下 2000A and below	
		≤ 50	2500A及以上 2500A and above	

1. 平均分闸速度是指断路器触头刚分后12mm的平均速度;
The average opening speed refers to the average speed of 12mm after the circuit breaker contact is just opened;
2. 平均合闸速度是指断路器触头合前12mm的平均速度。
The average closing speed refers to average speed of 12mm before the circuit breaker contact is closed.

储能电机技术参数 Energy Storing Motor

型号 Model	额定电压 (V) Rated voltage	额定输入功率 (W) Rated power input	正常工作电压范围 The range of normal working voltage	额定电压下的储能时间 (S) Energy storage time under rated voltage
ZYJ55-1	DC110V	100	85% ~ 110% 额定电压 85% ~ 110% Rated voltage	≤ 15
	DC220V			

合、分闸电磁铁及相关电气元件技术参数 Technical Parameters of the Closing and Opening Electromagnet and Related Components

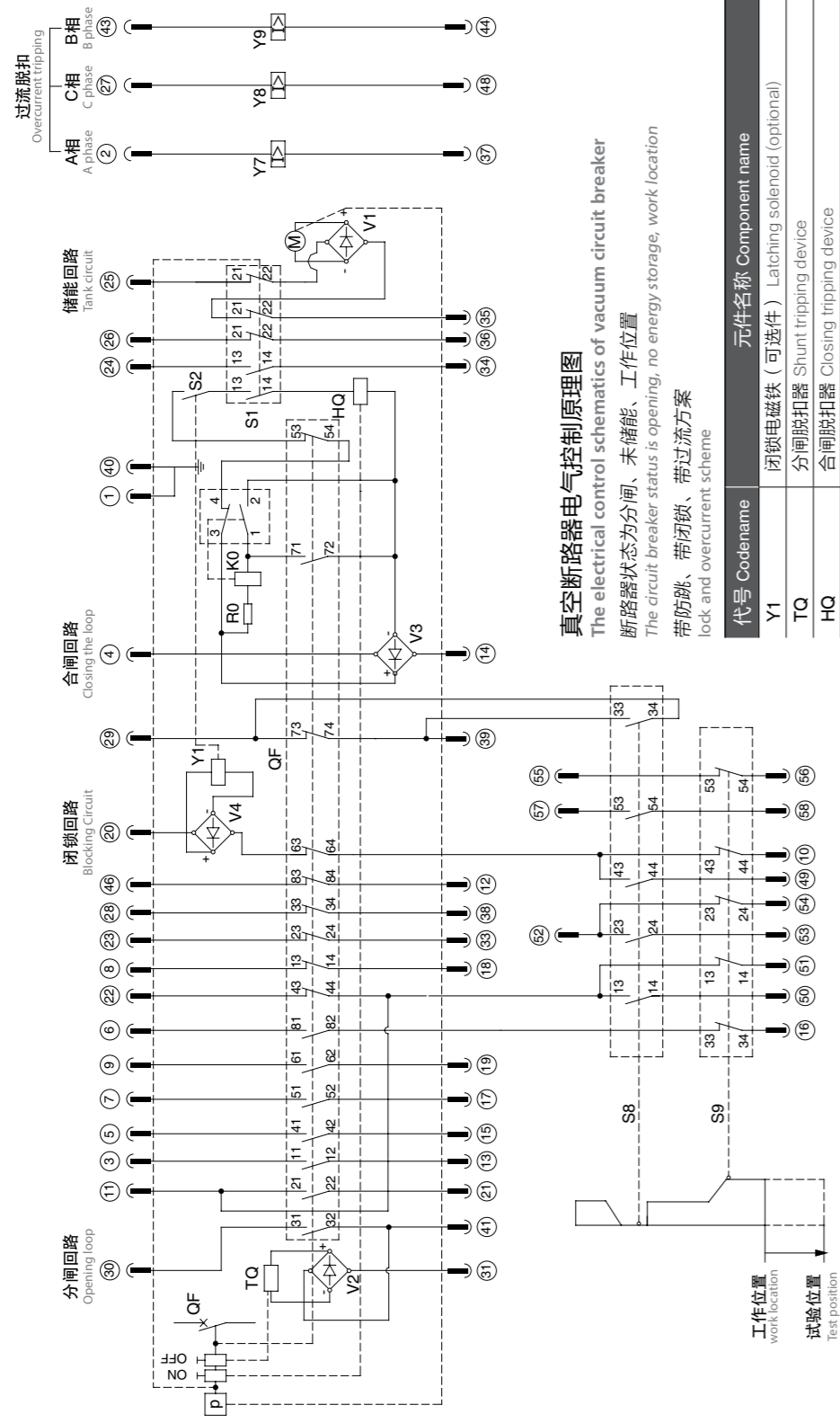
项目 Item	类别 Category	合闸电磁铁 Closing electromagnet		分闸电磁铁 Opening electromagnet		闭锁电磁铁 Latching electromagnet		防跳继电器 Anti-trip relay	
		DC220	DC110	DC220	DC110	DC220	DC110	DC220	DC110
额定工作电压 (V) Rated operational voltage		DC220	DC110	DC220	DC110	DC220	DC110	DC220	DC110
额定工作电流 (A) Rated operational current		1.3	2.6	1.3	2.6	25 mA		9.1 mA	
额定电功率 (W) Electrical rating		288	288	288	288	2.7		1.0	
正常工作电压范围 The range of normal working voltage		85% ~ 110% 额定电压 85% ~ 110% rated voltage		65% ~ 120% 额定电压低于30% 额定电压时, 开关不能分闸 When the 65% ~ 120% rated voltage is less than 30% rated voltage, the switch cannot be opened.		-		-	

二次控制回路方案组合 Scheme of the Double-control Circuit

控制电压 Control voltage	闭锁方案 Blocking scheme	防跳方案 Anti-trip scheme	欠压脱扣方案 Undervoltage tripping scheme	过流脱扣方案 Overcurrent tripping scheme		
				带过流脱扣器 With overcurrent tripper	过流脱扣器数量 Quantity of overcurrent trippers	动作电流值 Action current value
AC 220V	带电气闭锁 With electric blocking	带防跳继电器 With anti-trip relay	带欠压脱扣 With undervoltage tripper	带过流脱扣器 With overcurrent tripper	过流脱扣器数量	动作电流值
DC 220V					2过流 / 3过流 2 overcurrent / 3 overcurrent	3.5 / 5 / 7.5 / 10
AC 110V	不带电气闭锁 Without electric blocking	不带防跳继电器 Without anti-trip relay	不带欠压脱扣 Without undervoltage tripper	不带过流脱扣器 Without overcurrent tripper		
DC 110V				不带过流脱扣器 Without overcurrent tripper		

高压真空断路器电气原理图

Electrical Schematic Diagram of HV Vacuum Circuit Breaker



真空断路器电气控制原理图

The electrical control schematics of vacuum circuit breaker
 断路器状态为分闸、未储能、工作位置
 The circuit breaker status is opening, no energy storage, work location
 带防跳、带闭锁、带过流方案
 lock and overcurrent scheme

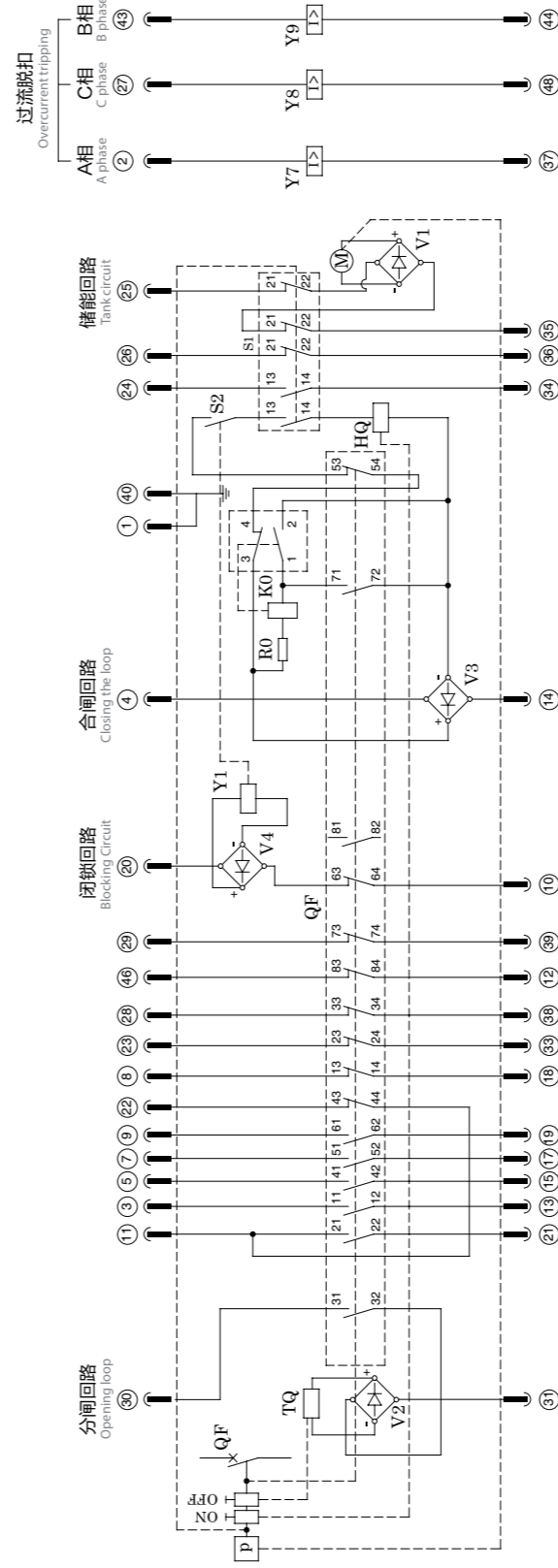
代号	Codename	元件名称	Component name
Y1		闭锁电磁铁 (可选件)	Latching solenoid (optional)
TQ		分闸脱扣器	Shunt tripping device
HQ		合闸脱扣器	Closing tripping device
P		手动储能	Manual storage
Y7 ~ Y9		间接式过流脱扣器 (可选件)	Indirect overcurrent tripping device (optional)
S1		储能电机用微动开关	Charging motor with micro switch
S2		闭锁电磁铁的微动开关 (可选件)	Locking electromagnet on the micro-switch (optional)
QF		断路器主轴的辅助开关	Auxiliary switch of spindle breaker
S8		用于试验位置的辅助开关	Auxiliary switch for test position
S9		用于工作位置的辅助开关	Auxiliary switch for the working position
M		储能电机	Charging motor
KO		机构内部防跳继电器 (可选件)	Inside anti-hop relay (optional)
RO		串联电阻	Series resistance
V1 ~ V4		整流元件	Rectifying element

说明:

过流脱扣器 (Y7 ~ Y9): 原理图中采用过流脱扣 (Y7即: 选用中间CT) 时, 则原理图中Y8、Y9回路取消; 原理图中采用2过流脱扣 (即选用Y7、Y8) 时, 则原理图中Y9回路取消, 不带过流时, 则Y7、Y8和Y9回路均取消。

Test position

Overcurrent tripping (Y7 Y9): Where overcurrent tripping is shown in schematic (Y7 i.e: to select intermediate CT), the Y8, Y9 loop in the schematic shall be cancelled; where two overcurrent trips (ie to select Y7, Y8) are shown in schematic, the circuit Y9 in the schematic shall be cancelled; where no overcurrent is present, Y7, Y8 and Y9 circuit shall be cancelled.



真空断路器电气控制原理图

The electrical control schematics of vacuum circuit breaker
 断路器状态为分闸、未储能
 Breaker status, including separating brake, no energy storage
 带防跳、带闭锁、带过流方案
 lock and overcurrent scheme

代号	Codename	元件名称	Component name
Y1		闭锁电磁铁 (可选件)	Latching solenoid (optional)
TQ		分闸脱扣器	Shunt tripping device
HQ		合闸脱扣器	Closing tripping device
P		手动储能	Manual storage
Y7 ~ Y9		间接式过流脱扣器 (可选件)	Indirect overcurrent tripping device (optional)
S1		储能电机用微动开关	Charging motor with micro switch
S2		闭锁电磁铁的微动开关 (可选件)	Locking electromagnet on the micro-switch (optional)
QF		断路器主轴的辅助开关	Auxiliary switch of spindle breaker
M		储能电机	Charging motor
KO		机构内部防跳继电器 (可选件)	Inside anti-hop relay (optional)
RO		串联电阻	Series resistance
V1 ~ V4		整流元件	Rectifying element

说明:

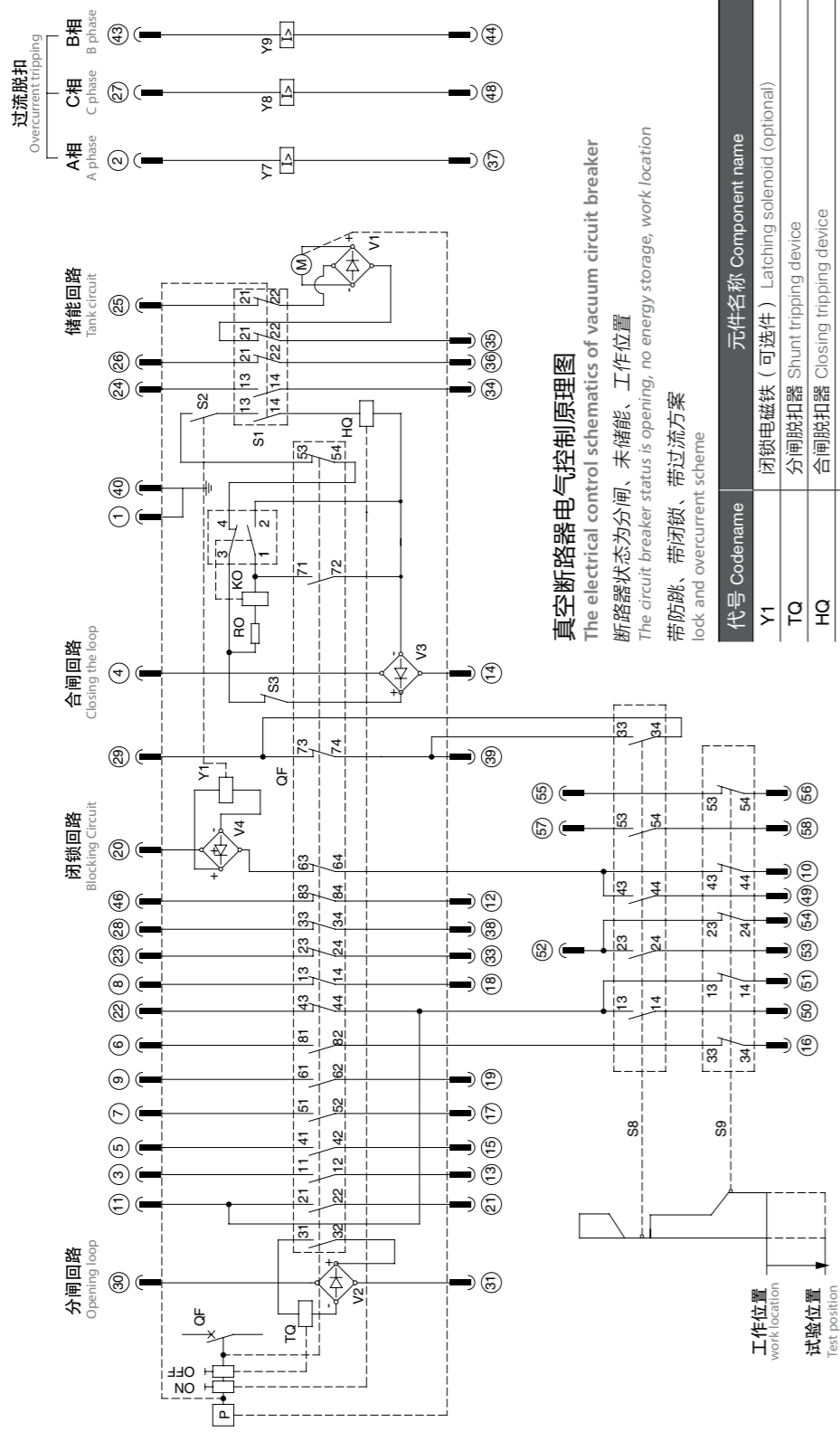
过流脱扣器 (Y7 ~ Y9): 原理图中采用过流脱扣 (Y7即: 选用中间CT) 时, 则原理图中Y8、Y9回路取消; 原理图中采用2过流脱扣 (即选用Y7、Y8) 时, 则原理图中Y9回路取消, 不带过流时, 则Y7、Y8和Y9回路均取消。

Test position

Overcurrent tripping (Y7 Y9): Where overcurrent tripping is shown in schematic (Y7 i.e: to select intermediate CT), the Y8, Y9 loop in the schematic shall be cancelled; where two overcurrent trips (ie to select Y7, Y8) are shown in schematic, the circuit Y9 in the schematic shall be cancelled; where no overcurrent is present, Y7, Y8 and Y9 circuit shall be cancelled.

高压真空断路器电气原理图

Electrical Schematic Diagram of HV Vacuum Circuit Breaker



真空断路器电气控制原理图

The electrical control schematics of vacuum circuit breaker
 断路器状态为分闸、未储能、未工作位置
 The circuit breaker status is opening, no energy storage, work location
 带防跳、带闭锁、带过流方案
 lock and overcurrent scheme

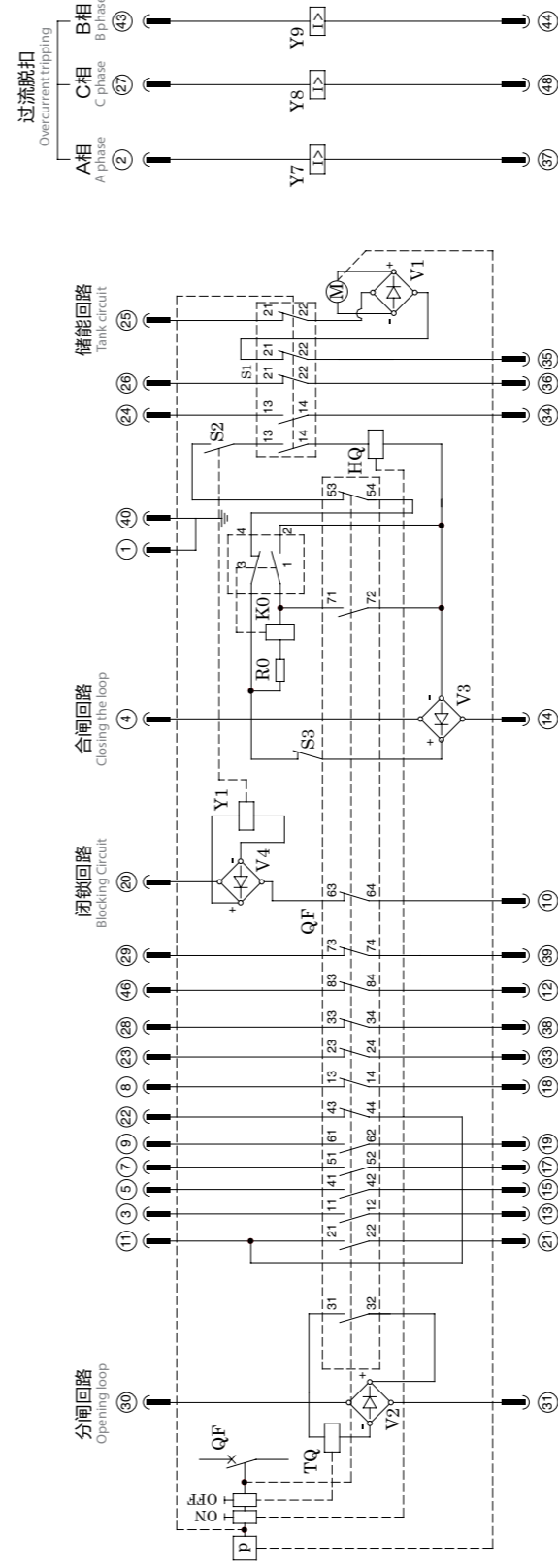
代号	Codename	元件名称	Component name
Y1		闭锁电磁铁 (可选件)	Latching solenoid (optional)
TQ		分闸脱扣器	Shunt tripping device
HQ		合闸脱扣器	Closing tripping device
P		手动储能	Manual storage
Y7 ~ Y9		间接式过流脱扣器 (可选件)	Indirect overcurrent tripping device (optional)
S1		储能电机用微动开关 (可选件)	Charging motor with micro switch
S2		闭锁电磁铁的微动开关 (可选件)	Locking electromagnet on the micro-switch (optional)
QF		断路器主触头的辅助开关	Auxiliary switch of spindle breaker
S8		用于试验位置的辅助开关	Auxiliary switch for test position
S9		用于工作位置的辅助开关	Auxiliary switch for the working position
M		储能电机	Charging motor
KO		机构内部防跳继电器 (可选件)	Inside anti-hop relay (optional)
RO		串联电阻	Series resistance
V1 ~ V4		整流元件	Rectifying element

说明:

过流脱扣器 (Y7 ~ Y9): 原理图中采用过流脱扣 (Y7即: 选用中间CT) 时, 则原理图中Y8、Y9回路取消; 原理图中采用2过流脱扣 (即选用Y7、Y8) 时, 则原理图中Y9回路取消, 不带过流时, 则Y7、Y8和Y9回路均取消。

Test position

Overcurrent tripping (Y7 ~ Y9): Where overcurrent tripping is shown in schematic (Y7 i.e. to select intermediate CT), the Y8, Y9 loop in the schematic shall be cancelled; where two overcurrent trips (ie to select Y7, Y8) are shown in schematic, the circuit Y9 in the schematic shall be cancelled; where no overcurrent is present, Y7, Y8 and Y9 circuit shall be cancelled.



真空断路器电气控制原理图

The electrical control schematics of vacuum circuit breaker
 断路器状态为分闸、未储能
 Breaker status, including separating brake, no energy storage
 带防跳、带闭锁、带过流方案
 lock and overcurrent scheme

代号	Codename	元件名称	Component name
Y1		闭锁电磁铁 (可选件)	Latching solenoid (optional)
TQ		分闸脱扣器	Shunt tripping device
HQ		合闸脱扣器	Closing tripping device
P		手动储能	Manual storage
Y7 ~ Y9		间接式过流脱扣器 (可选件)	Indirect overcurrent tripping device (optional)
S1		储能电机用微动开关	Charging motor with micro switch
S2		闭锁电磁铁的微动开关 (可选件)	Locking electromagnet on the micro-switch (optional)
QF		断路器主触头的辅助开关	Auxiliary switch of spindle breaker
M		储能电机	Charging motor
KO		机构内部防跳继电器 (可选件)	Inside anti-hop relay (optional)
RO		串联电阻	Series resistance
V1 ~ V4		整流元件	Rectifying element

说明:

过流脱扣器 (Y7 ~ Y9): 原理图中采用过流脱扣 (Y7即: 选用中间CT) 时, 则原理图中Y8、Y9回路取消; 原理图中采用2过流脱扣 (即选用Y7、Y8) 时, 则原理图中Y9回路取消, 不带过流时, 则Y7、Y8和Y9回路均取消。

Test position

Overcurrent tripping (Y7 ~ Y9): Where overcurrent tripping is shown in schematic (Y7 i.e. to select intermediate CT), the Y8, Y9 loop in the schematic shall be cancelled; where two overcurrent trips (ie to select Y7, Y8) are shown in schematic, the circuit Y9 in the schematic shall be cancelled; where no overcurrent is present, Y7, Y8 and Y9 circuit shall be cancelled.

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