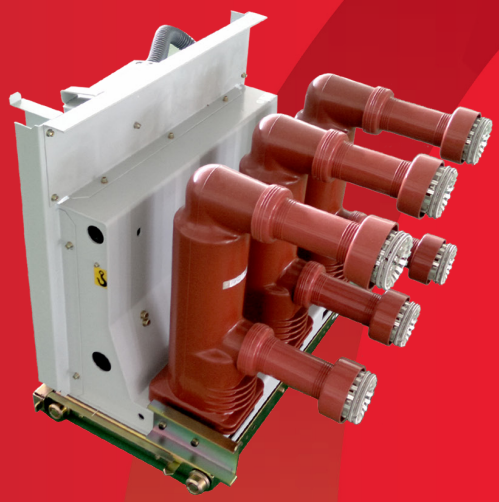
SOJO

Add: Office 1111of DBuilding, Jiahua Plaza, No.9 of Shangdi 3rd Street,
Haidian District, Beijing of China.(100085)
http://www.sojoline.com E-mail:sojo@sojoline.com
Tel:8610-62979948 Fax:8610-62988464

SOJO

VS1 SERIES

Medium Voltage Vaccum Circuit Breaker



BEIJING SOJO ELECTRIC CO., LTD.

CONTENTS /



INTRODUCTION

Founded in December 2002, Beijing SOJO Electric Co., Ltd. is a joint-stock high-tech enterprise, whose registered capital is 276 million RMB. Currently there are more than 700 employees. The headquarter is located at Silicon Valley of China-Zhongguancun Shangdi Information Industry Zone, Beijing. SOJO is mainly engaged in the research and development, production, sales and export of power distribution equipment and automation equipment in the field of 35kV (or lower) power transmission and distribution networks.

In April, 2015, SOJO was officially listed in Shenzhen Stock Exchange (SZSE) (Stock Code: 300444; Stockname: SOJO Electric).

Through more than 12 years, SOJO constantly grows in strength; its products are applied in over 97% of provinces and municipalities of China, wining wide applause from users. In 2009 and 2010, 2-year continuous, SOJO has been named as “Top 12 Best Innovated SMEs in Z-Park” and 3-year continuous named as “Forbes China Best SMEs”. SOJO is the first batch of domestic companies which independently develop and produce compact switchgears, has nearly hundred products including substation, ring main unit, pole-mounted switch, medium and low voltage switchboard, power distribution remote monitoring system, fault detection equipment, cable accessories and etc. Currently, SOJO Electric has one international invention patent, 27 domestic invention patents and 64 utility model patents.

1.Introduction

VS1 (VJY1) series Medium Voltage Vacuum Circuit Breaker is device under vacuum for indoor installation. VS1 series medium voltage vacuum circuit-breakers with lateral operating mechanism for indoor installation feature the separate pole construction technique.

VS1 accords with standards of GB/T 1984-2014, JB/T 3855-2008, DL/T 403-2000 and IEC 62271-100.

The circuit breaker adopts the operating mechanism and circuit breaker integrated design, which can be used as a fixed installation unit or withdrawable unit with special propulsion mechanism.

2.Model Explanation

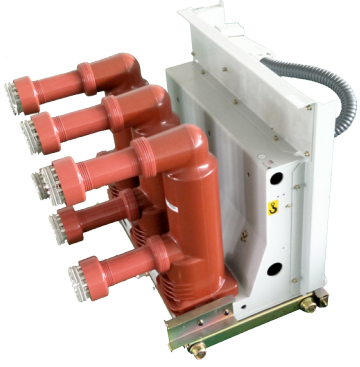
VS 1 – 12 / □ – □

- Rated short circuit breaking current
- Rated current
- Rated voltage
- Product design number
- Vacuum circuit breaker

3.Operating Conditions

3.1 Normal Service Conditions

- ● Ambient air temperature:
  - ○ Less than or equal to 40° C
  - ○ Greater than or equal to – 15° C.
- ● Altitude:
  - ○ Less than or equal to 1000 m
  - ○ Above 1000 m, a derating coefficient is applied (please consult us).
- ● Atmosphere:
  - ○ No dust, smoke or corrosive or inflammable gas and vapor, or salt (clean industrial air).
- ● Humidity:
  - ○ Average relative humidity over a 24 hour period ⩽ 95%
  - ○ Average relative humidity over a 1 month period ⩽ 90%
  - ○ Average vapor pressure over a 24 hour period ⩽ 2.2 kPa
  - ○ Average vapor pressure over a 1 month period ⩽1.8 kPa.
- ● Installation site: without fire risk, explosion hazard, heavy pollution, chemical corrosion and violent vibration.



3.2 Specific Operating Conditions (please consult us)

VS1 has been developed to meet the following specific conditions:

- temperature (possible derating)
- corrosive atmospheres, vibrations, (possible adaptation).

For special operation conditions, SOJO could provide special design and supply according to requirements.

4.Specification and Technical Parameter

4.1 General Specifications

Table 1 General Specifications

No	Item		Unit	Value					
1	Rated Voltage		kV	12			24		
2	Rated insulation level	Rated lightning impulse withstand voltage（phase to phase, to earth）	kV	75			125		
		1min Power frequency withstand voltage（phase to phase, to earth）	kV	42			65		
		Rated lighting impulse voltage peak (open contacts)	kV	85			125		
		1 min power frequency withstand voltage (open contacts)	kV	48			65		
3	Rated short circuit current		kA	25	31.5	40	20	36	31.5
4	Rated current		A	630 1250	1250 1600 2000 2500 3150	1250 1600 2000 2500 3150 4000	630 1250	1250 1600 2000 2500 3150	
5	Rated short-time withstand current（effective value）		kA	25	31.5	40	25	31.5	40
6	Rated short-time withstand current（peak value）		kA	63	80	100	63	80	100
7	Rated short-circuit making current（peak value）		kA	63	80	100	50	63	80
8	Breaking times of rated short circuit breaking current		Time	50					
9	Secondary circuit power frequency withstand voltage (1min)		V	2000					
10	Rated operating sequence			o-0.3S-co-180S-co o-180S-co-180S-co					
11	Rated thermal stabilization time		s	4					
12	Rated single capacitor bank breaking current		A	630					
13	Rated back-to-back capacitor bank breaking current		A	400					
14	Mechanical endurance		Time	10000					

4.2 Technical Specification after assembling adjustment

Table 2 Technical Specification after assembling adjustment

No	Item	Unit	Value									
			12KV					24KV				
1	Clearance between open contacts	mm	9±1					12±1				
2	Contacting travel		3.5±0.5					4±1				
3	Average closing speed (6mm ~ contact close)	m/s	0.8±0.2					1±0.2				
4	6mm）Average opening speed (contact close~6mm)		1.1±0.2					1.3±0.2				
5	Openingtime (rated voltage)	ms	20-50					⩽50				
6	Closing time (rated voltage)		30-70					35-100				
7	Contacts closing time	ms	⩽2			⩽3(40KA)		⩽3				
8	Non-synchronicity of three phase opening		⩽2					⩽2				
9	Dynamic and static contact accumulative thickness	mm	3									
10	Resistance of main circuit	μΩ	630	1250	1600	2000	2500	630	1250	1600	2000	2500	3150
			≤40	≤40	≤35	≤35	≤25	≤55	≤50	≤40	≤40	≤35	≤30

4.3 Energy Storage Motor

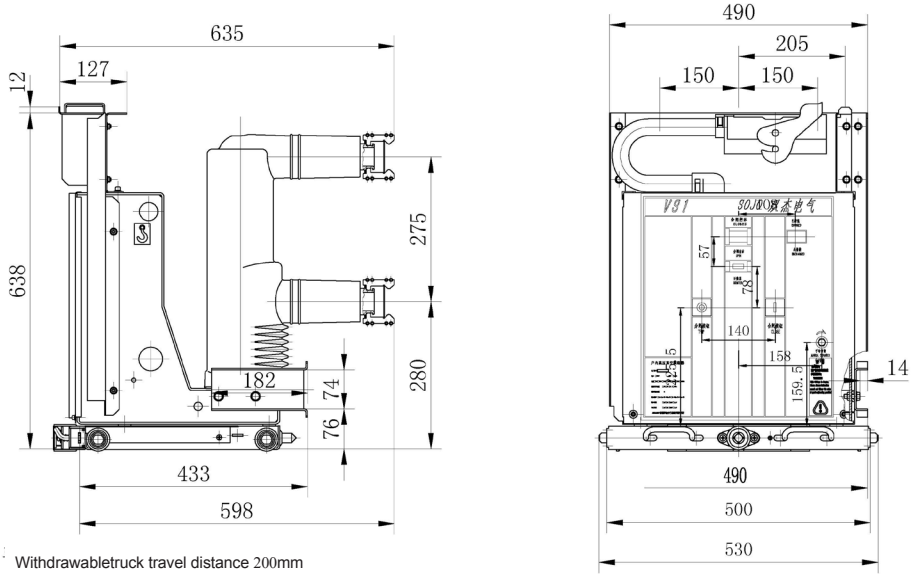
The circuit breaker has adopted single phase DC motor; and the operation voltage is allows DC and AC power supply. The technical data are shown in following table.

Table 3. Technical data of energy storage motor

Type	Rated voltage	Rated input power	Normal working voltage range	Charging time under rated voltage
64ZY-CJ1070-027 64ZY-CJ2070-005	DC110 DC220	70	85%～110%Rated voltage	≤15

5.Overall Dimensions

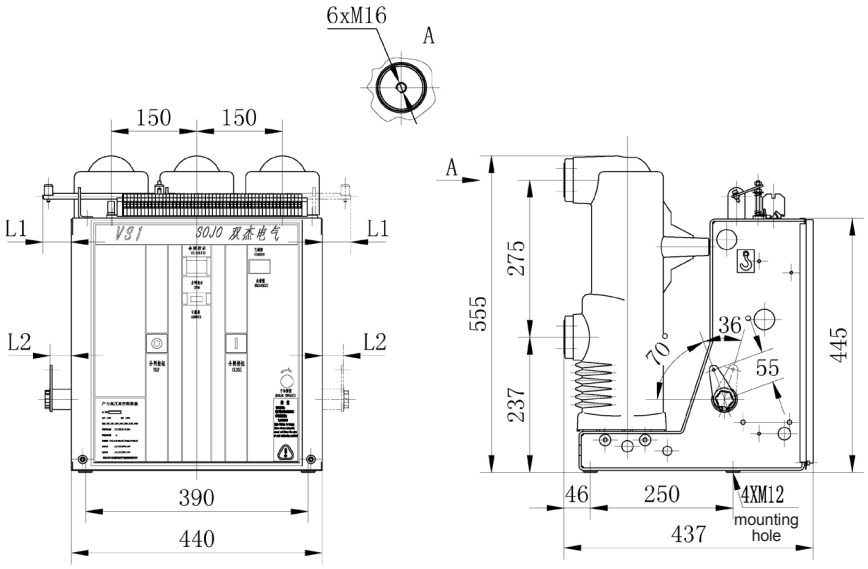
5.1 Figure 1. Withdrawable VS1-12 (650)dimension
5.2 Figure 2. Fixed VS1-12 (650)dimension
5.3 Figure 3. Withdrawable VS1-12 (800)dimension
5.4 Figure 4. Fixed VS1-12 (800)dimension
5.5 Figure 5. Withdrawable VS1-12 (1000)dimension
5.6 Figure 6. Fixed VS1-12 (1000)dimension
5.7 Figure 7. Side mounted VS1-12dimension
5.8 Figure 8. Withdrawable VS1-24 (1000) dimension
5.9 Figure 9. Withdrawable VS1-24 (1000) (Large current)dimension



Withdrawabletruck travel distance 200mm

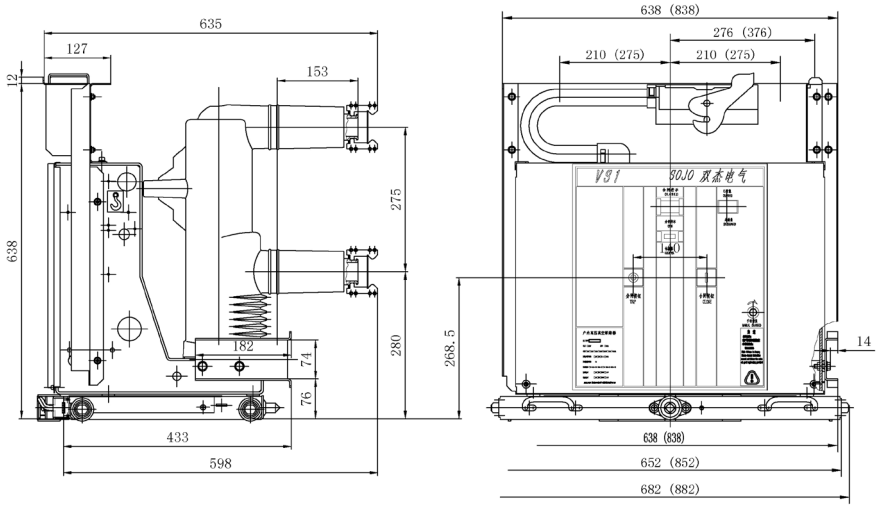
Rated Current（A）	630	1250
Rated short-circuit making current（kA）	20、25、31.5	20、25、31.5
Relative static contacts dimension（mm）	Φ35	Φ49
Distancebetween phases (mm)	150±1.5	

Figure 1. Withdrawable VS1-12（650）dimension



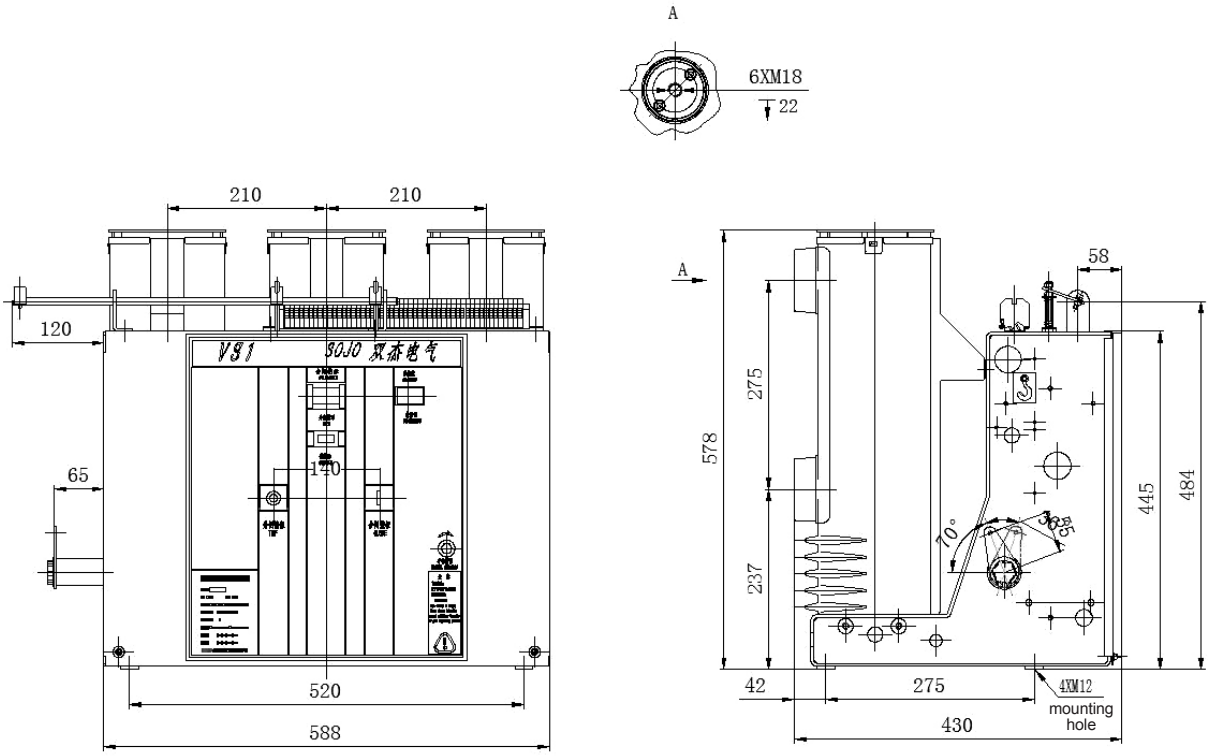
Rated Current（A）	630	1250
Rated short-circuit making current（kA）	20、25、31.5	20、25、31.5
Relative static contacts dimension （mm）	Φ35	Φ49
Distance between phases (mm)	150±1.5	
Top interlocking functions L1 (mm)	50（The interlock extended from either left or right, and the length can be customized according to customer's requirement.）	
Spindle interlocking functions L2 (mm)	36（The interlock extended from either left or right, and the length can be customized according to customer's requirement.）	

图2 Figure 2. Fixed VS1-12（650）dimension



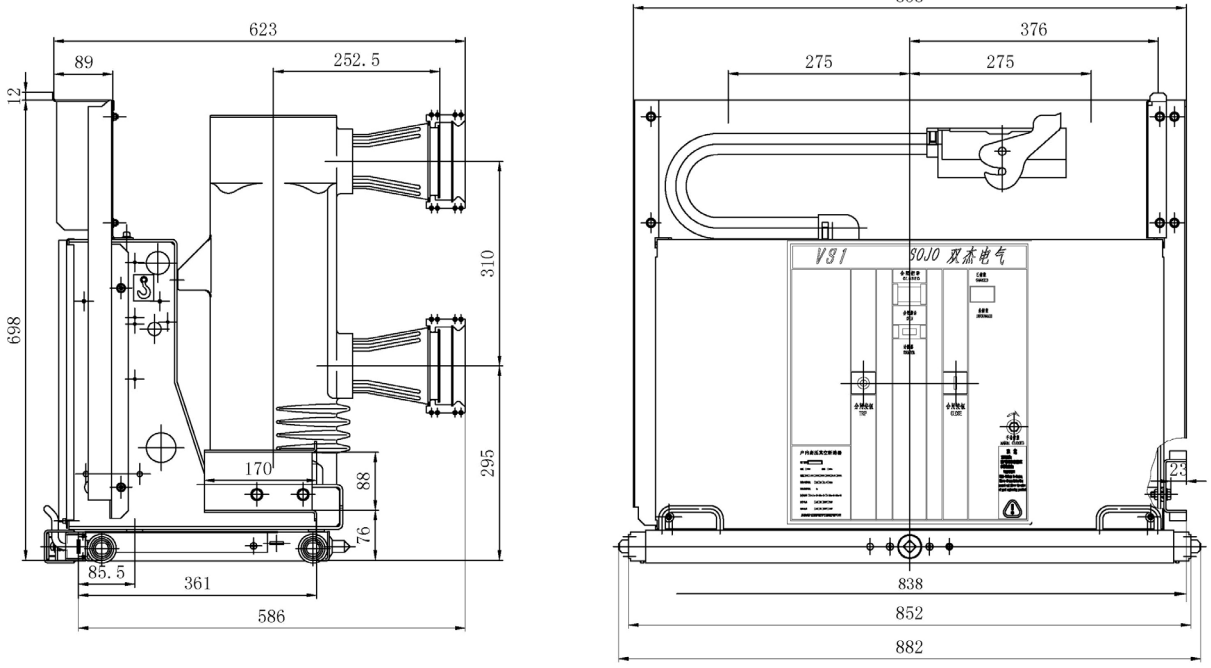
Rated Current（A）	630	1250	1600
Rated short-circuit making current（kA）	20、25、31.5	20、25、31.5、40	31.5、40
Relative static contacts dimension（mm）	Φ35	Φ49	Φ55
Distance between phases (mm)	150±1.5		

Figure 3. Withdrawable VS1-12（800）dimension



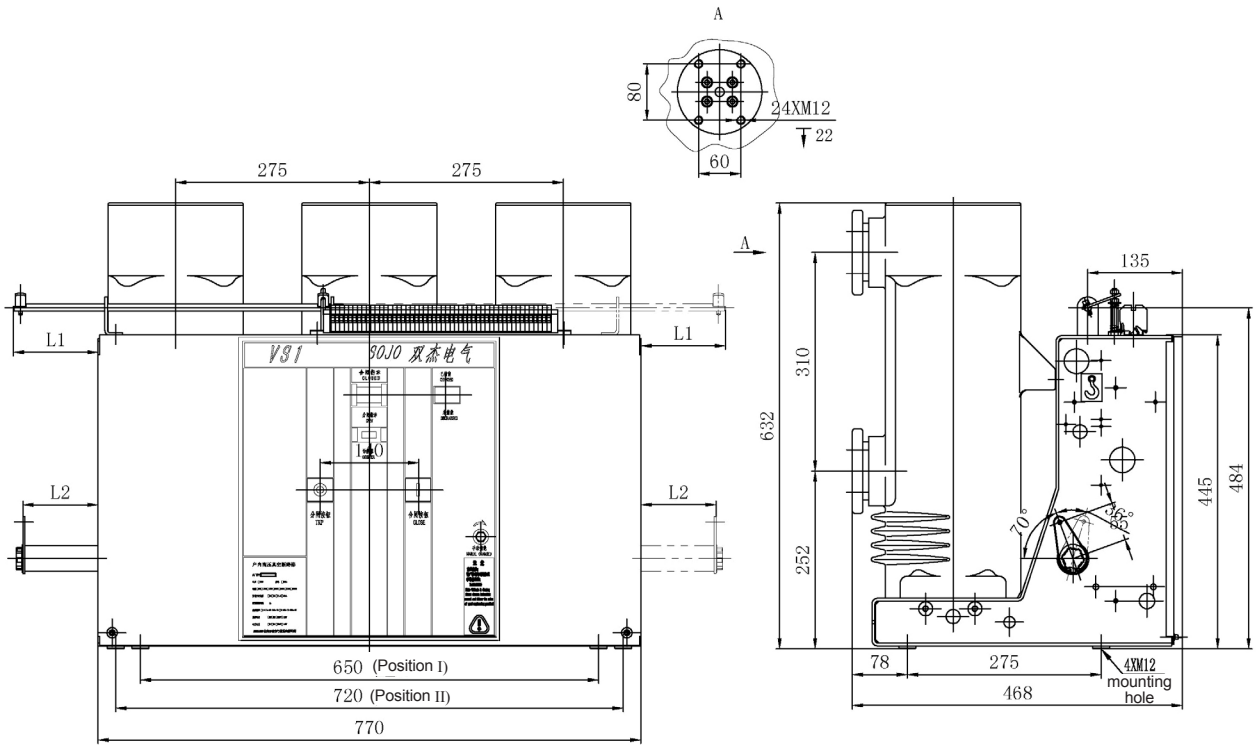
Rated Current（A）	630	1250	1600
Rated short-circuit making current（kA）	20、25、31.5	20、25、31.5、40	31.5、40
Relative static contacts dimension （mm）	Φ35	Φ49	Φ55
Distance between phases (mm)	210±1.5		
Top interlocking functions (mm)	50， 120， 150， 200 （The interlock extended from either left or right, and the length can be customized according to customer's requirement）		
Spindle interlocking functions (mm)	36， 106， 136， 186 （The interlock extended from either left or right, and the length can be customized according to customer´ s requirement）		

Figure 4. Fixed VS1-12（800）dimension



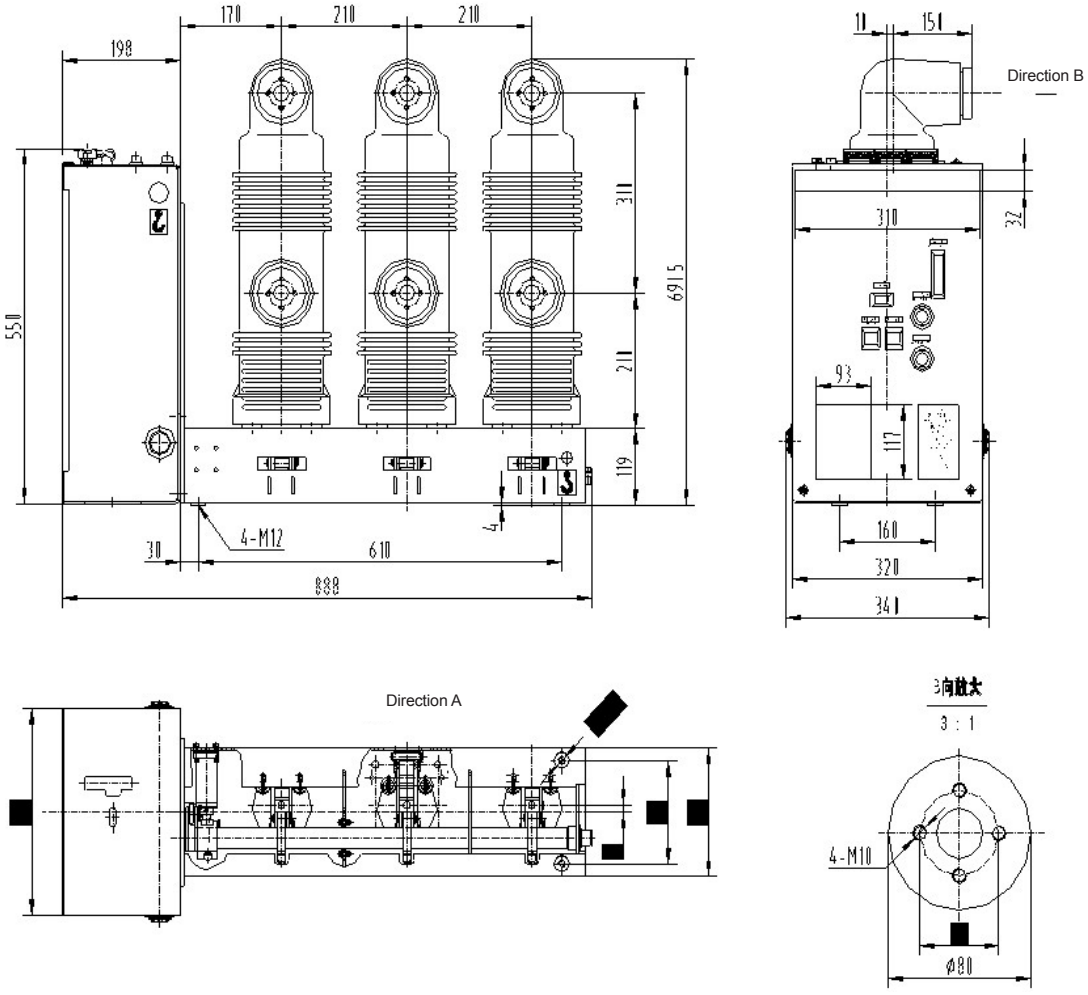
Rated Current（A）	1600/2000	2500	3150	4000
Rated short-circuit making current（kA）	31.5、40	31.5、40	31.5、40	40、50
Relative static contacts dimension（mm）	Φ79	Φ109		
Distance between phases (mm)	275±1.5			

Figure 5. Withdrawable VS1-12（1000）dimension



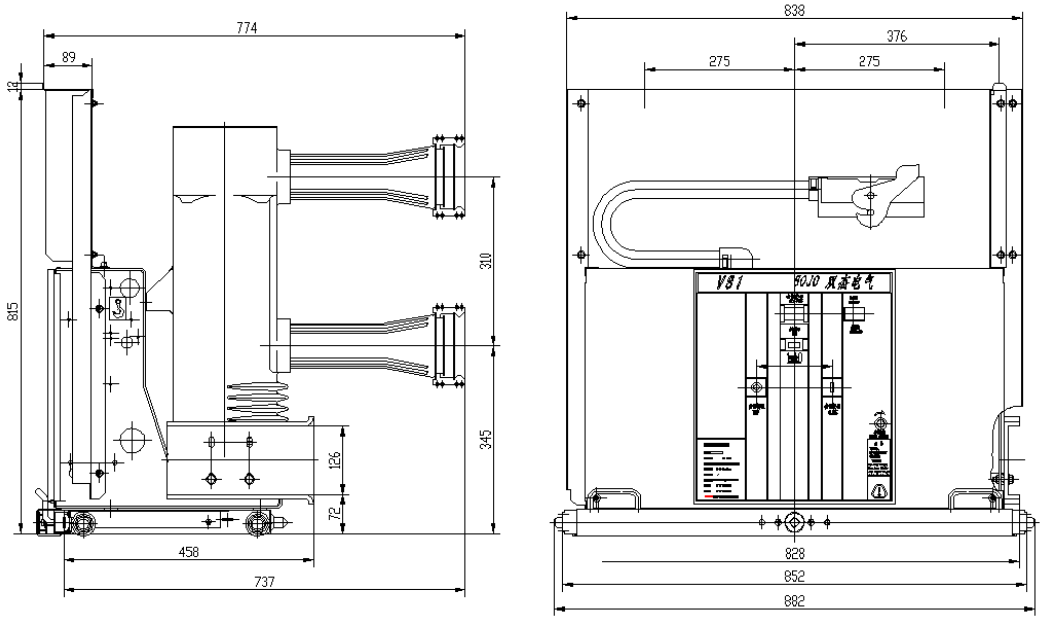
Rated Current（A）	1600/2000	2500	3150	4000
Rated short-circuit making current（kA）	31.5、40	31.5、40	31.5、40	40、50
Relative static contacts dimension（mm）	Φ79	Φ109		
Distance between phases (mm)	275±1.5			
Top interlocking functions L1 (mm)	50， 120， 150， 200 （The interlock extended from either left or right, and the length can be customized according to customer's requirement）			
Spindle interlocking functions L2 (mm)	36， 106， 136， 186 （The interlock extended from either left or right, and the length can be customized according to customer's requirement）			

Figure6. Fixed VS1-12（1000）dimension



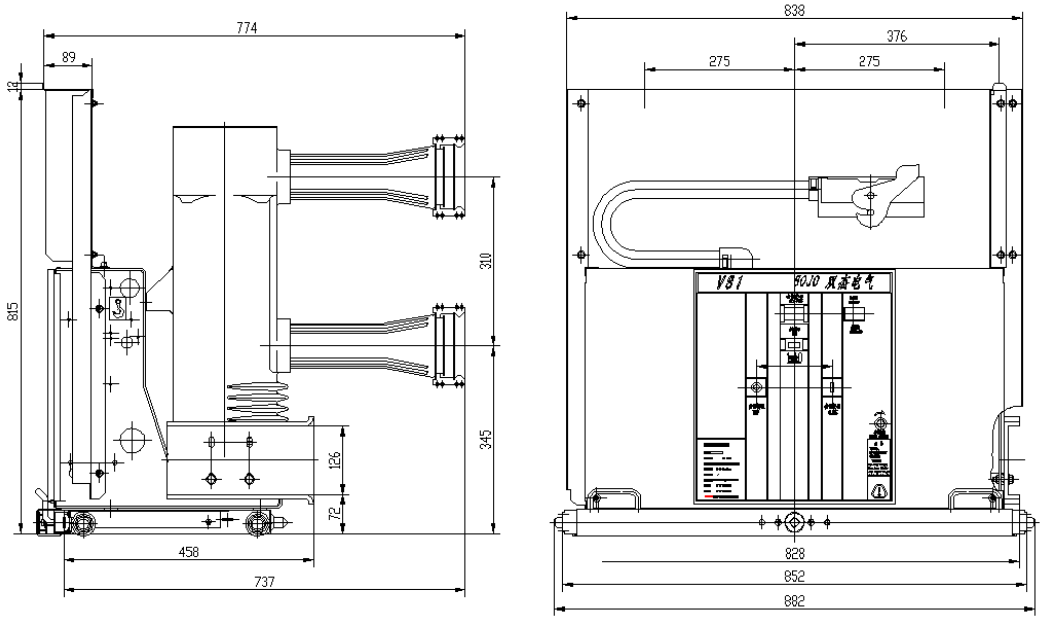
Rated Current（A）	400	630	1250
Rated short-circuit making current（kA）	20、25、31.5	20、25、31.5	20、25、31.5
Distance between phases (mm)	210±1.5		

Figure 7. Side mounted VS1-12dimension



Ratedcurrent（A）	630	1250	1600
Rated short-circuit making current（kA）	20、25、31.5	25、31.5、40	31.5、40
Relative static contacts dimension D (mm)	Φ35	Φ49	Φ55
Distance between phases (mm)	(210)、275±1.5		

Figure 8. Withdrawable VS1-24（1000）dimension



Rated current（A）	1600	2000	2500	3000
Rated short-circuit making current（kA）	31.5、40		31.5、40	
Relative static contacts dimension D （mm）	Φ79		Φ109	
Distance between phases(mm)	275±1.5			

Figure 9. Withdrawable VS1-24（1000）(Large current)dimension

6.Principle of Vacuum circuit breaker

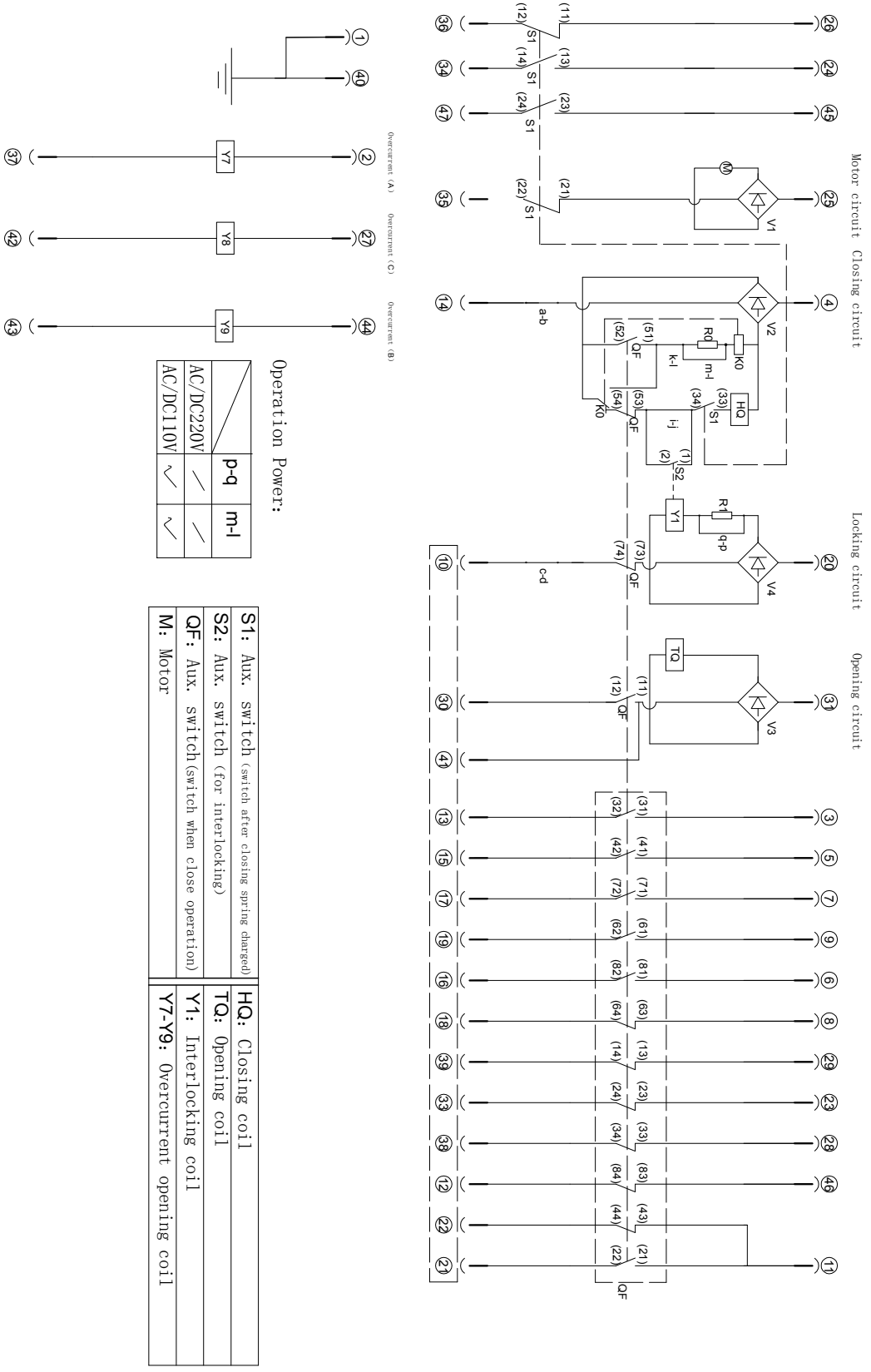
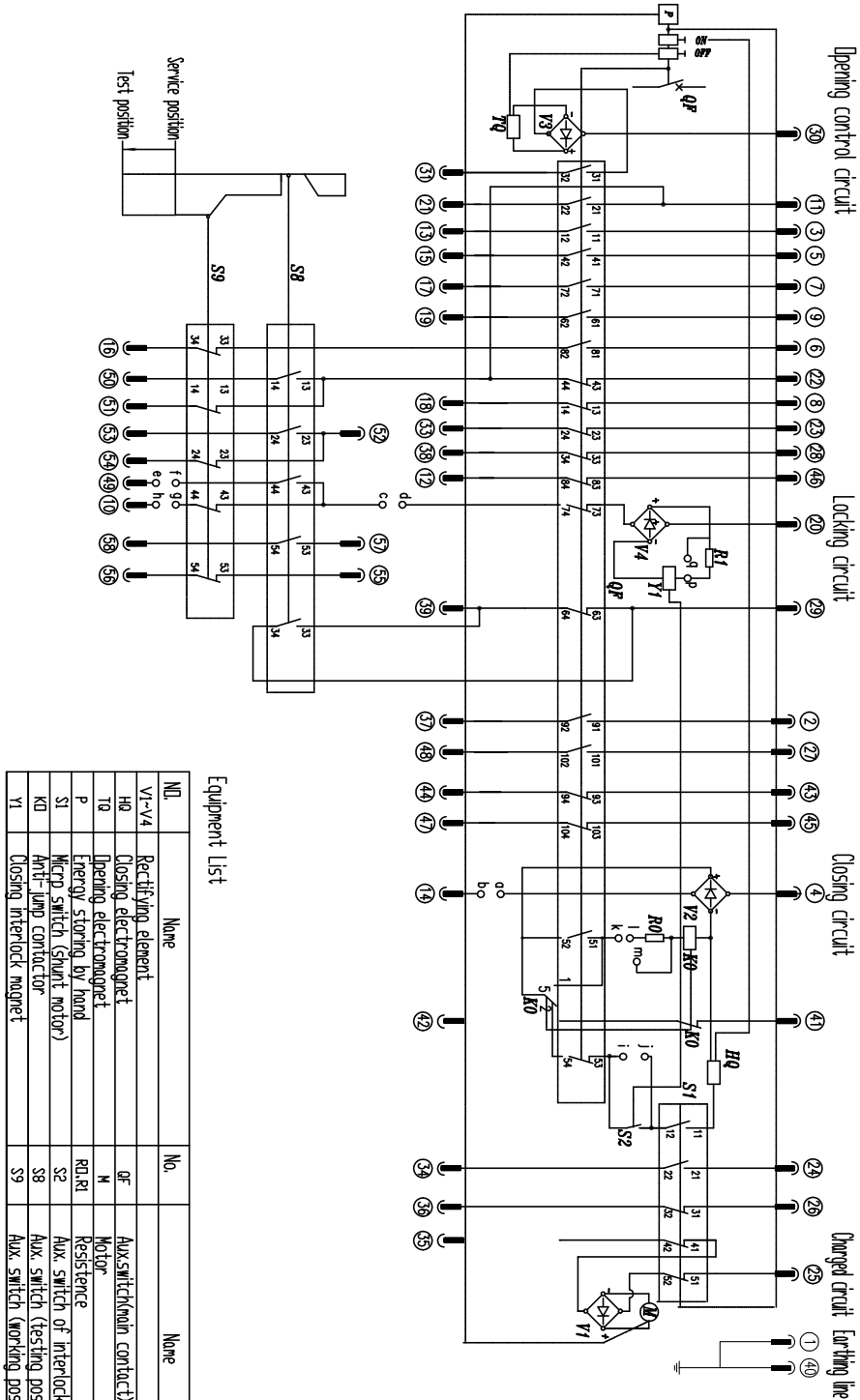


Figure 10. Internal principle diagram of fixed VS1 circuit breaker



Equipment List

NO.	Name	No.	Name
V1~V4	Rectifying element	QF	Aux.switch(main contact)
HQ	Closing electromagnet	M	Motor
TQ	Opening electromagnet	R0,R1	Resistence
P	Energy storing by hand	S2	Aux. switch of interlock magnet
S1	Micro switch (shunt motor)	S8	Aux. switch (testing position)
KO	Anti-jump contactor	S9	Aux. switch (working position)
Y1	Closing interlock magnet		

Figure 11.Internal principle diagram of withdrawableVS1 circuit breaker