

Medium Voltage Component

ZN63S-12 (VS1+) Indoor AC High Pressure Vacuum Breaker

1. General

ZN63S-12 (VS1+) indoor AC high pressure vacuum breaker is a kind of indoor high pressure switch equipment of 3-phase AC, 50 Hz, with rated voltage of 7.2~12Kv. It is used as protection and control element in electric wire netting equipment, power equipment of industrial and mineral enterprises.

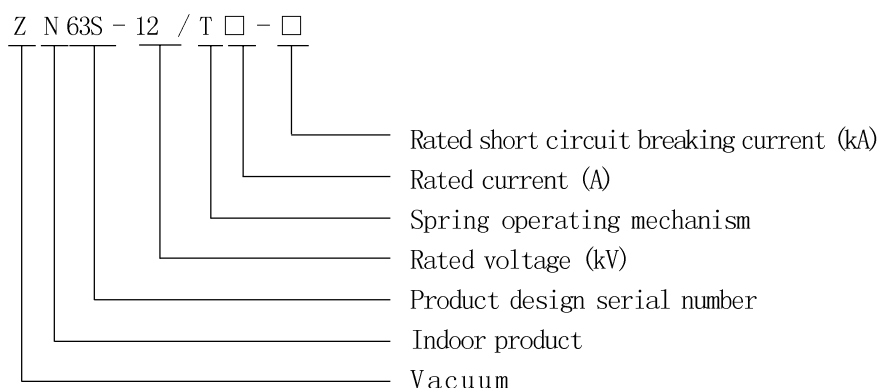
The breaker conforms to the national standards GB1984-89 "AC High Pressure Breaker", JB3855-96 "3.6~40.5Kv Indoor AC High Pressure Vacuum Breaker", DL403-91 "Technical Conditions for Ordering 10-35Kv Indoor High Pressure Vacuum Breaker" and as well as the relative IEC standards. It has reliable interlocking function.

ZN63S-12 (VS1+) indoor AC high pressure vacuum breaker can perform frequent operations with multi-breaking and quick on-switching ability.

ZN63S-12 (VS1+) indoor AC high pressure vacuum breaker adopts the design of integrating the operating mechanism with the breaker, available for serving as permanently installed unit, or as hand trolley unit after equipped with underframe.



2. Type & Meaning



3. Normal Use Conditions

1. Altitude: not exceeding 1000m
2. Ambient temperature
Maximum : +40oC
Minimum: -15oC (-30oC is allowed during storage and transportation)
3. Ambient temperature
Daily average relative humidity: ≤95%
Monthly average relative humidity: ≤90%
Daily average saturated vapor pressure: ≤2.2 x KPa
Monthly average saturated vapor pressure: ≤1.8 x KPa
4. Used in the places free from any fire, explosion danger, severe pollution, chemical corrosion and excessive vibration.

4. Technical Data

1. Main technical data of breaker

No.	Item	Unit	Value			
1	Rated voltage	kV	12			
2	Rated frequency	Hz	50			
3	Rated lightning impulse withstand voltage (peak value)	kV	75			
4	Rated instantaneous power frequency withstand voltage (1 min)	kV	42			
5	Rated short circuit breaking current	kA	20	25	31.5	40
6	Rated current	A	630	630	1250	1250
			1250	1250	1600	1600
					2000	2000
					2500	2500
					3150	3150
7	Rated instantaneous withstand current (effective value)	kA	20	25	31.5	40
8	Rated peak value withstand current (peak value)	kA	50	63	80	100
9	Rated short circuit on-switching current (peak value)	kA	50	63	80	100
10	Rated short circuit current lasting time	S	4			
11	Mechanical life	Times	30000			10000
12	Secondary circuit power frequency withstand voltage(1 min)	V	2000			
13	Rated operating sequence	0-t-C0-t ^l -C0				

Note: 20kA, 25kA, 31.5kA t=0.3s, t=180s 40kA t=180s t_l=180s

2. Mechanical features data of breaker

No.	Item	Unit	Value	
1	Clearance between open contacts	m m	9 ± 1	
2	Contact travel	m m	3 ± 0.5	
3	Contact switching on bounce time	m s	≤ 2 (40kA ≤ 3)	
4	Different time of switching-on and off of 3 phases	m s	≤ 2	
5	Average switching-off speed	m/s	1.1 ± 0.2	
6	Average switching-on speed	m/s	0.6 ± 0.2	
7	Switching-off time (rated voltage)	m s	≤ 50	
8	Switching-on time (rated voltage)	m s	≤ 100	
9	Rated closing, opening operating voltage	V	AC110/220 DC110/220	
10	Rated voltage of energy storage motor	V	AC110/220 DC110/220	
11	Rated frequency of energy storage motor	W	70 (40kA 100W)	
12	Energy storage time	s	10	
13	Accumulated permitted wearing thickness of moving & static contact	m m	3	
14	Resistance of main conductive circuit		630A 1250A 1600-2000A 2500-3150A 4000A	≤ 50 μ Ω ≤ 45 μ Ω ≤ 35 μ Ω ≤ 25 μ Ω ≤ 20 μ Ω
15	Contact pressure of switching-on contact		20kA-25kA 31.5kA 40kA	2000N-2500N 3000N-3500N 4500N-5000N

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5. Structure of Products and Working Principle

1. General Structure of Breaker

ZN63S-12 (VS1⁺) Indoor AC High Pressure Vacuum Breaker consists of operating mechanism and interrupter, which are laid in front and at the back respectively. The main conductive circuit is of 3-phase structure. The upper and lower outlets base and interrupter are installed in a tubular insulated canister, which is cast of epoxy resin with APG process, therefore, it has high creepage resistance. The structure is designed in such a way that dust is not so easy to accumulate on the surface of interrupter, as a result, it can not only prevent the vacuum interrupter from being damaged due to external factors, but also ensure its high resistance to voltage effect in damp, hot and severer pollution environment.

2. Structure of Operating Mechanism

ZN63S-12 (VS1⁺) Indoor AC High Pressure Vacuum Breaker is equipped with new SS1 spring operating mechanism, which has manual and electric energy storage function. The structure is simple with high reliability. The operating mechanism is placed inside of the engine case in front of the interrupter. The engine case of the breaker is used as frame of the operating mechanism at same time. The operating mechanism and the vacuum interrupter are laid in front and in the back to form an integral part of ZN63S-12 (VS1⁺) Indoor AC High Pressure Vacuum Breaker so that the operating performance of the operating mechanism match the closing and opening requirement of the interrupter, energy is saved since the unnecessary intermediate operations are eliminated and ZN63S-12 (VS1⁺) Indoor AC High Pressure Vacuum Breaker has more reliable performance. ZN63S-12 (VS1⁺) Indoor AC High Pressure Vacuum Breaker can be either installed in the hand trolley type switch cabinet, or in the fixed switch cabinet.

3. Interruption Principle

The vacuum interrupter equipped for breaker has extremely high vacuum degree. When the moving, static contacts switch off charged under the action of the operating mechanism, electric arc will be produced at the contacts, at same time, adequate longitudinal magnetic field will form in the clearance of the contacts so as to make the vacuum electric arc maintain dispersed, and allow the electric arc distributed uniformly on the contact surface for burning and maintain a low electric arc voltage. When the current occurs natural zero pass, the residual ion, electron and metallic vapor will compound or aggregate on the surface of the contacts and shielding cover in a few seconds. The insulating strength of the medium at the fracture of the interrupter recovers very soon, therefore the electric arc is interrupted, and insulation is realized. Due to the adoption of the longitudinal magnetic field vacuum quenching room, the structure has strong and stable interrupting current capability.

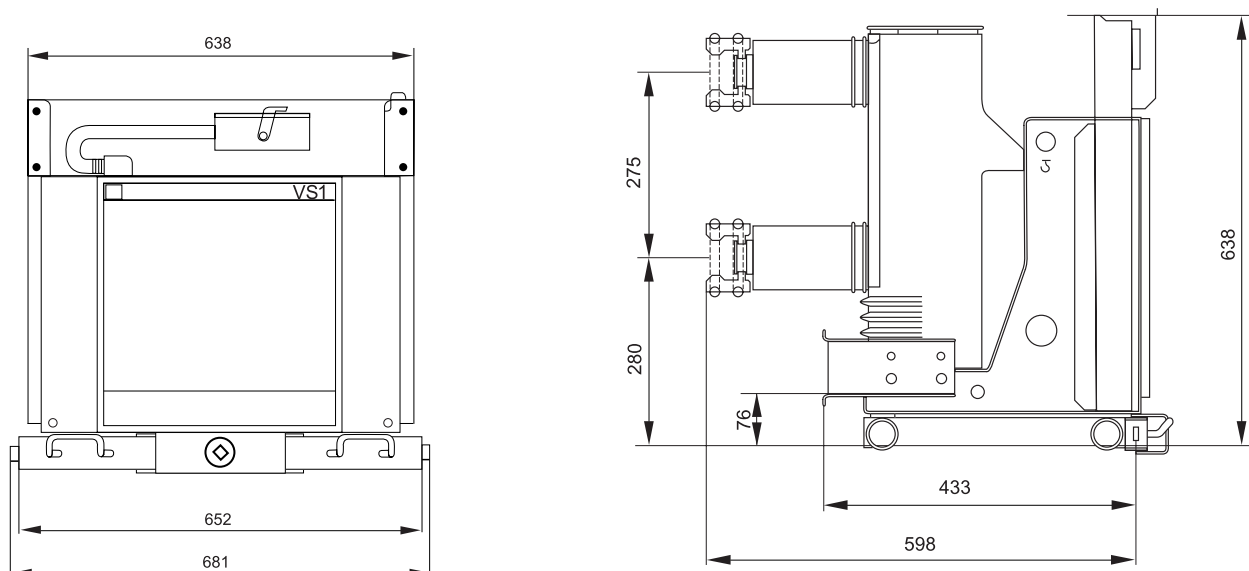
4. Error interlock prevention

The breaker has very perfect and reliable error false operation function.

- a. After the switching-on operation, the breaker will not switch on again without switching-off operation.
- b. After the switching-on operation, the internal debouncing control circuit of the breaker will cut off the switching-on circuit to prevent repeated switching-on if the switching-on signal is not eliminated on time.
- c. The breaker will not perform switching-on operation if the hand trolley breaker is not in the test position or working position so as to prevent the breaker entering into the loading zone under switching-on status.
- d. The hand trolley will not move after the hand trolley breaker has switched on in the working position or test position so as to prevent pulling out or pushing into the loading zone during the switching-on status.
- e. The switching-on deadlock can be configured as per the demand of the customer so as to prevent manual switching-on operation when the secondary control power supply is not connected.

6. Outline Drawing of Breaker & Installation

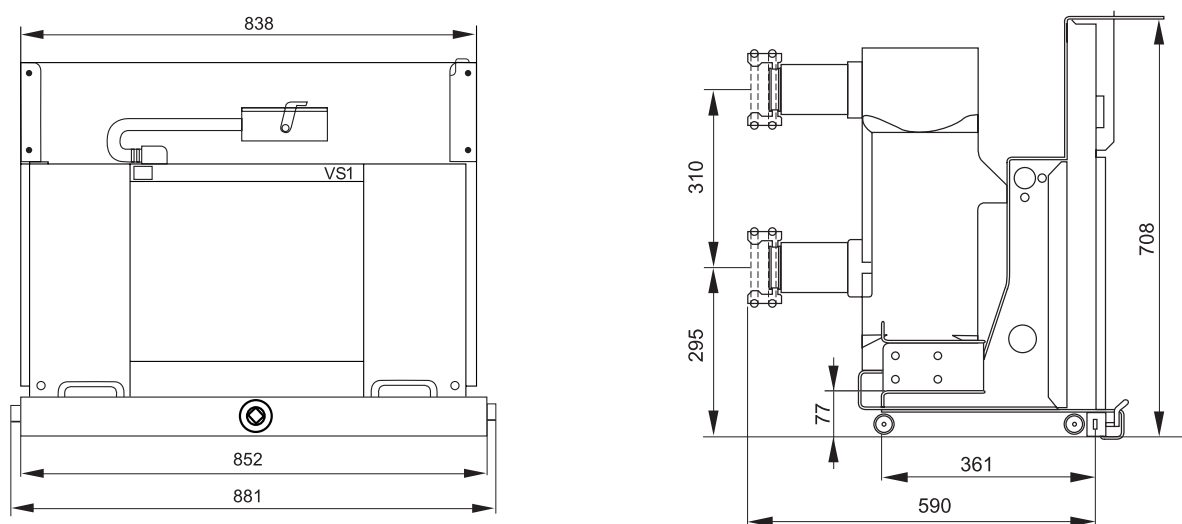
Overall dimension of withdrawable type ZN63S-12 (VS1⁺) (Fig. 4)



The engagement size of the moving, static contact shall be not less than 15mm, and one phase distance shall be 210 ± 1.5 mm.

Rated current (A)	630	1250	1600
Rated short circuit breaking current (kA)	20, 25	20, 25, 31.5, 40	31.5, 40
Matched static contact size(mm)	Φ 35	Φ 49	Φ 55

Overall dimension of withdrawable type ZN63S-12 (VS1⁺) (Fig. 5)

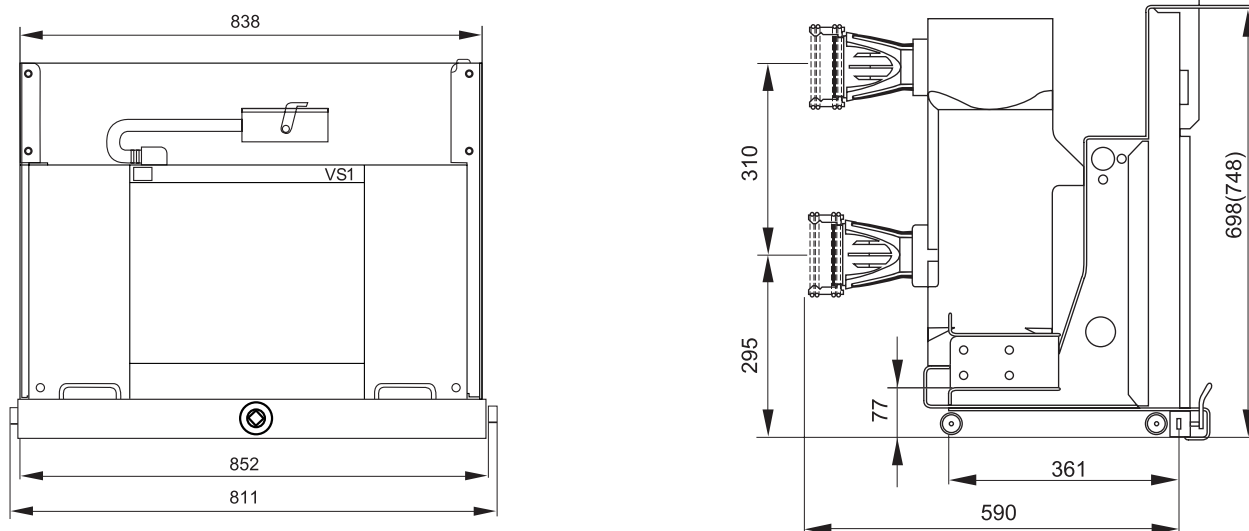


The engagement size of the moving, static contact shall be not less than 15mm, and one phase distance shall be 275 ± 1.5 mm.

Rated current (A)	1600	2000
Rated short circuit breaking current (kA)	25, 31.5, 40	31.5, 40
Matched static contact size(mm)	Φ 79	

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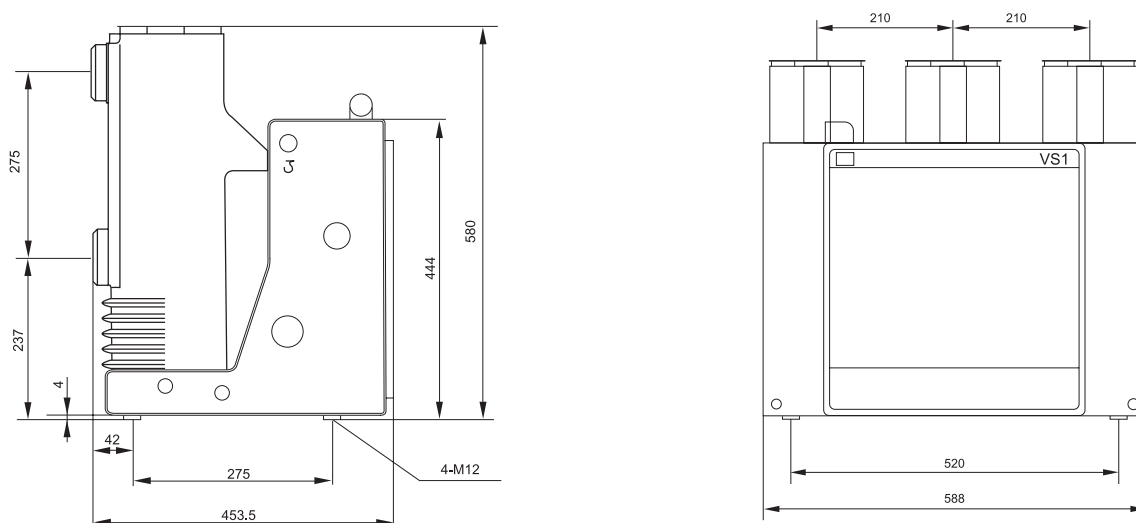
Overall dimension of withdrawable type ZN63S-12 (VS1+) (Fig. 6)



The engagement size of the moving, static contact shall be not less than 15mm, and one phase distance shall be 275 ± 1.5 mm.

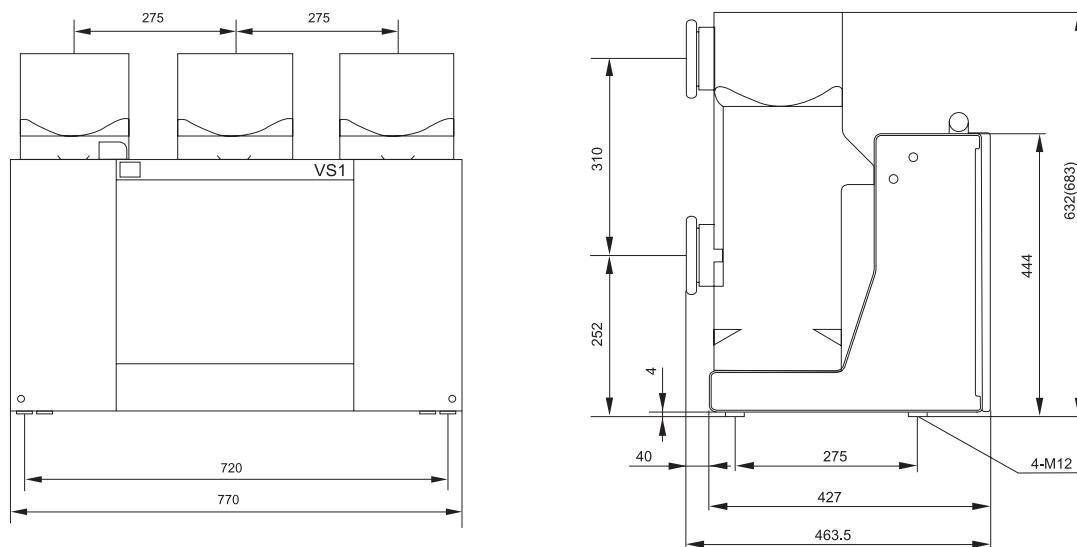
Rated current (A)	2500	3150	4000
Rated short circuit breaking current (kA)	31.5, 40	40	
Matched static contact size(mm)	Φ 109		

Overall dimension of fixed type ZN63S-12 (VS1 +) (Fig. 7)



Rated current (A)	630	1250	1600
Rated short circuit breaking current(kA)	20, 25	20, 25, 31.5, 40	31.5, 40

Overall dimension of fixed type ZN63S-12 (VS1 +) (Fig. 8)



Rated current (A)	1600	2000	2500	3150, 4000
Rated short circuit breaking current(kA)	31.5, 40	31.5, 40	31.5, 40	40

7. Notes for Placing Order

The customer should specify the following:

1. Model, name and quantity of breaker;
2. The rated current and rated short circuit breaking current of breaker;
3. Rated operating voltage type and rated value (AC or DC);
4. Optional elements schedule;
5. Name and quantity of spare parts, components;
6. Any particular requirement should be indicated during placing order.