

VHZ4

Vacuum circuit breaker

12–17.5KV

630–4000A

25–40KA

Vacuum interrupter

Modular operating mechanism



THE POWER OF ENGINEERING



VHZ4

Vacuum circuit breaker

Overview

Vacuum interrupter's Integral pouring and Hi-Rel modularized operating mechanism technologies , are used on the VHZ4 Vacuum Circuit Breaker. The concise and simple design concept and digital manufacturing process makes features of high reliability and interchangeability , plus easy operation and maintenance come true.

Valuable circuit breaker, complete equipment of switch solution for engineering project, is now provide by VHZ4 vaccum circuit breakers. It apply to withdrawable or fixed switchgear, as well as reconstruction project.Suitable for circuit breaker applications such as transformers, motors, cables, overhead lines, generators, capacitor banks, medium voltage power electronic equipment, inductive equipment and other electrical equipment.



VHZ4 suits for NXSAFE (KYN) withdrawable switchgear, or other fixed switchgears





VHZ4®

Medium voltage vacuum circuit breaker

Cogear modular mechanism

Mechanical Feature

VHZ4 vacuum circuit breaker has COGEAR type spring operating mechanism

Concise and simple design concept bring less parts with high reliability

Modular design make it removable as a whole

Combine single spring energy storage to gear drive bring low noise and long mechanical life

Mechanical anti-jump device

Lockout mechanism with anti-error operation

Easy installation and AC/DC universal secondary accessories

Built-in energy storage handle

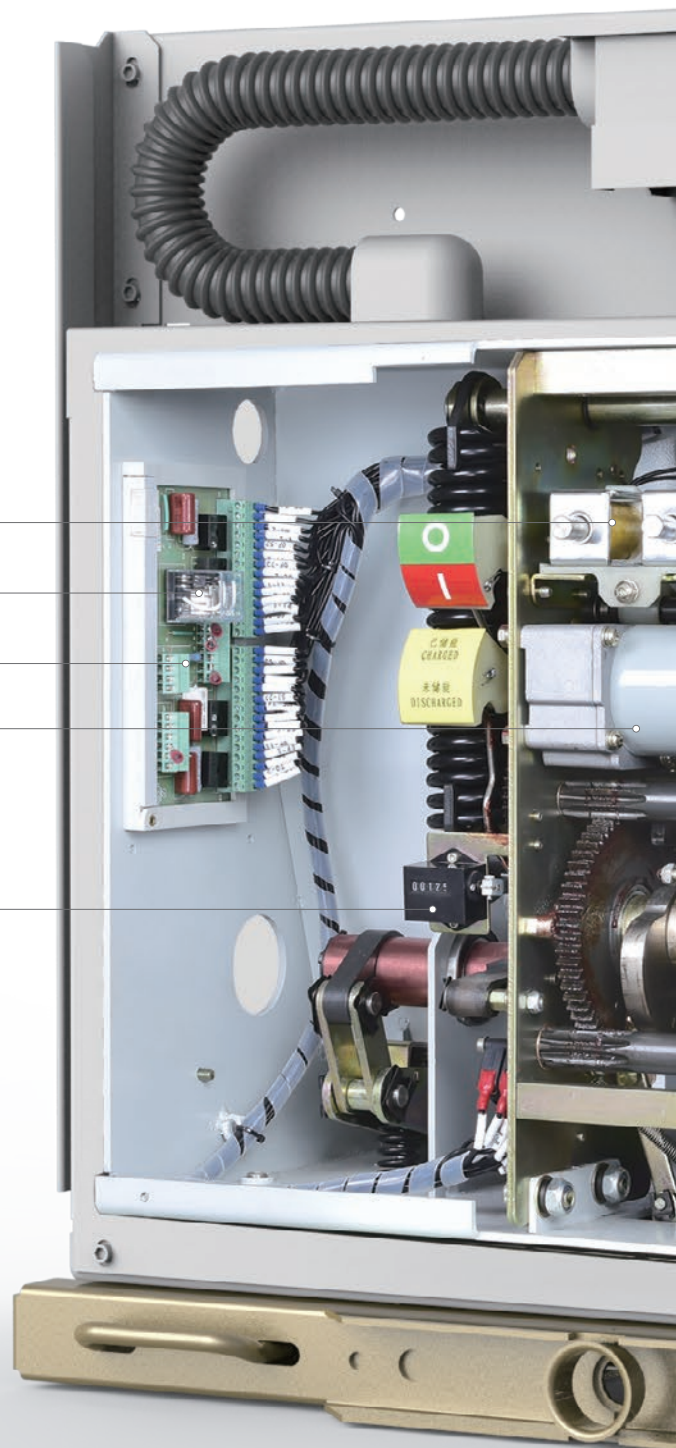
Tripper

Anti-jump relay

Control circuit board

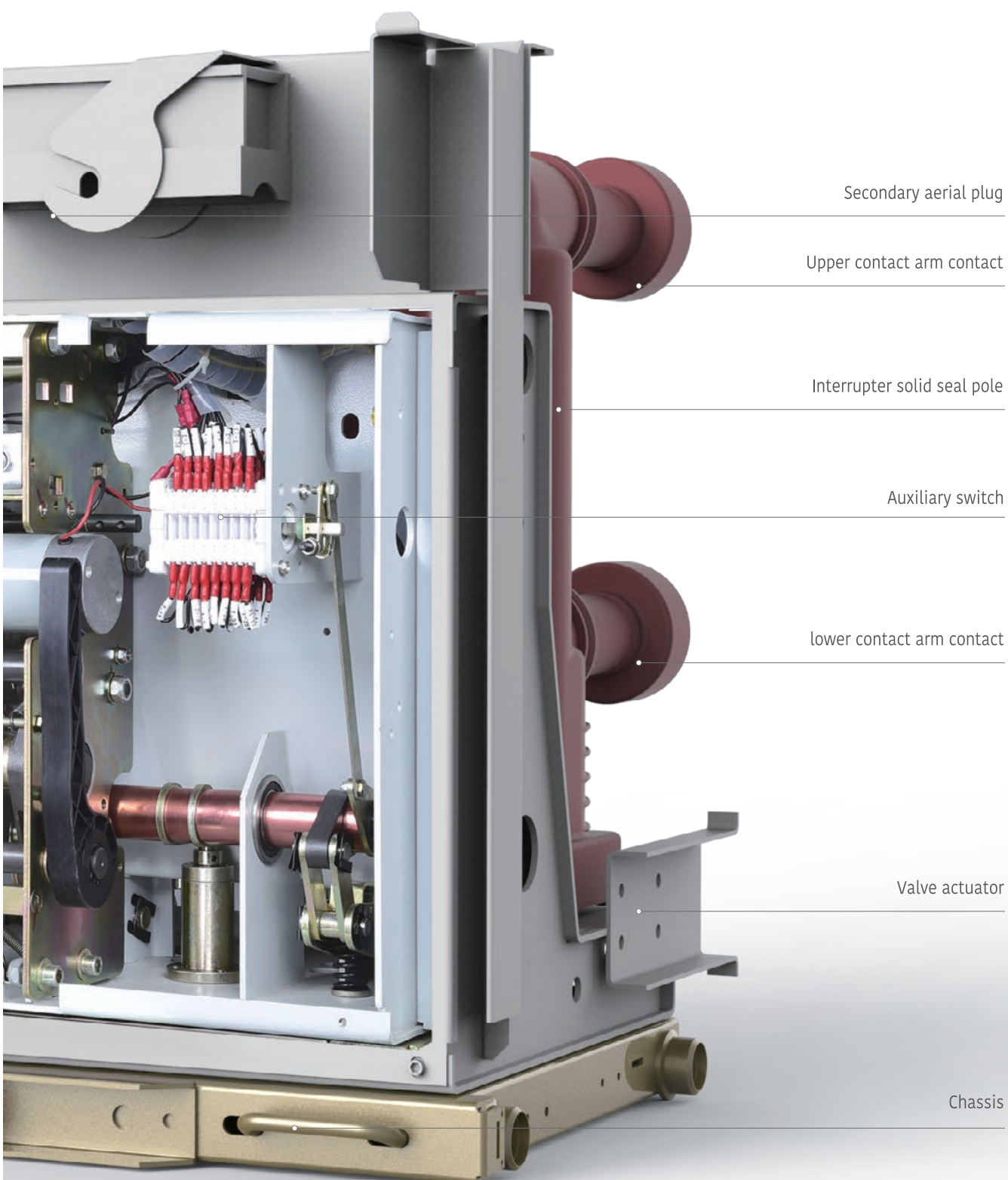
Energy storage motor

Counter



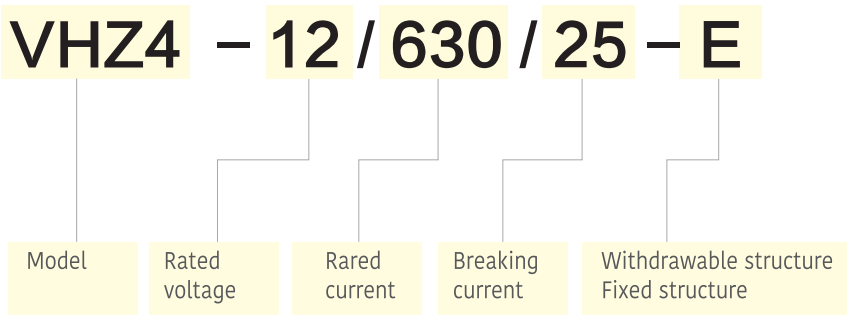
VHZ4®

Medium voltage vacuum circuit breaker



Design Notes

Product model naming rules



Standards

VHZ4 series vacuum circuit breakers follow standards as

IEC62271-100

GB1984-2003

DL/T402

Application

Rated short circuit breaking current and not full load current

Breaking asymmetric current

Automatic reclosing

ON/OFF no-load cable and no-load overhead lines

Out-of-phase breaking

ON/OFF no-load transformer

Breaking out of phase grounding fault current

Breaking TRV or short-circuit current starts with a steep-gradient

ON/OFF motor and inductor with adjustable air gap

Environmental conditions & weather resistance

Temperature	-5℃~40℃
Altitude	1000m Above 1000m, insulation parts of circuit breakers and switchgear shall be modified according to the principle of GB / T11022 and IEC60694, and the model with high altitude test shall be used.
Seismic performance	General mechanical vibration does not affect the use of circuit breakers. In ships and oil offshore platforms, the model be certified by the classification society should be used.
Humid tropical environment	Tolerant UNI3564-65 / C ambience Meet IEC60721-2-1 test Meet IEC60068-2-2 test Meet IEC60068-2-30 test

VHZ4®

Medium voltage vacuum circuit breaker

Panel / Vacuum interrupter / overall pouring pole

VHZ4 Panel operation



- 1 ON/OFF indicator
- 2 Manual ON button
- 3 Manual OFF button
- 4 Spring stored energy indicator
- 5 Nameplate
- 6 counter
- 7 Manual stored energy handle handle
- 8 Outer box and outer box panel

Vacuum interrupter

Vacuum interrupting technology of vacuum interrupter

Breaking capacity of 25-40KA

Contact oxidation and pollution

Compact

Environmentally friendly

Long life



Integral pouring pole

Pole Integral pouring technology

Protect the interrupter from mechanical impact and moisture, dust, etc

Integral pouring, full sealed, strong weatherability

High insulation properties



Accessories

Tripper

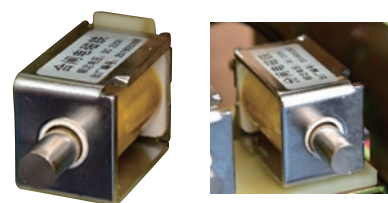
Auxiliary tripper Y3、Y2/Y10

The auxiliary tripper coil is driven by an auxiliary power supply. The coil is only designed for short-term work, so its circuit needs to connect the auxiliary switch ganded the switch spindle, in order to disconnect the current loop after circuit breaker finish the operation.

Overcurrent tripper Y7、Y8、Y9

(for mutual inductor type overcurrent tripper) In the case of a short circuit or overcurrent, the overcurrent tripper can make the circuit breaker trip itself. When the protection device is activated, the transformer current actuates the tripper, so that the switch opens.

The tripper have 0.5A, 1A, and 5A specifications.



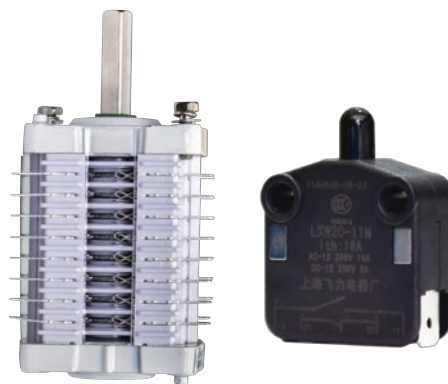
Auxiliary switch

Switch position auxiliary switch QF

The auxiliary switch is directly connected by the middle of the circuit breaker spindle through the middle bar. Its position is always consistent with the main contact's. Indicating opening or closing status of the circuit breaker. Wiring, interlocking auxiliary tripper, prevent misoperation

Energy storage position auxiliary switch S1

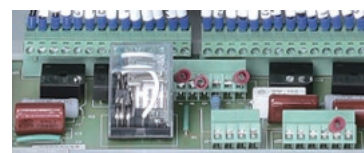
The auxiliary switch is mainly used to detect and indicate the energy storage status, and linkage with the energy storage mechanism to ensure that the drive mechanism to complete the closing operation, also automatic storage of energy. After the completion of energy storage, disconnect the electric energy storage circuit.



Anti-jump relay

Anti-jump relay K0

If the circuit breaker is continuously issued with the closing and opening commands, the circuit breaker returns to the opening position after its closing and remains until the new closing command is issued. In this way, it can prevent continuous ON /OFF (ie "anti-jump").



VHZ4®

Medium voltage vacuum circuit breaker

Accessories

Counter

Counter

A counter is installed on the operator interface to record the number of times the circuit breaker is operated.



Energy storage motor

Energy storage motor M

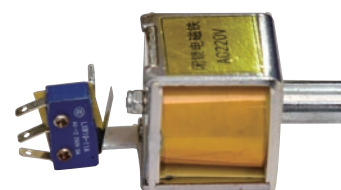
It performs the electric energy storage operation for the operation of the circuit breaker and prepares the operation for the next closing of the circuit breaker.



Lockout electromagnet

Closing lockout electromagnet Y1

The circuit breaker can not normally close switch on (including the manual operation) when the secondary control power is lost.



Technical parameters

VHZ4-12kV vacuum circuit breaker

Model	Phase spacing	Rated voltage	Rated insulation level		Rated operating frequency	Rated current	Rated peak withstand current (50 / 60Hz)	Rated short-time withstand current (4s)	Rated short circuit breaking current		No-load cable breaking current
			Short time power frequency withstand voltage	lightning impulse withstand voltage					Rated short circuit breaking current	DC component percentage	
	mm	kV	kV	kV	Hz	A	kA	kA	kA	%	A
VHZ4-12-630-25	210/275	12	42	75	50		63	25	25	45	25
VHZ4-12-1250-25	210/275										
VHZ4-12-1600-25	210/275										
VHZ4-12-2000-25	210/275										
VHZ4-12-2500-25	275										
VHZ4-12-3150-25	275										
VHZ4-12-4000-25	275										
VHZ4-12-630-31.5	210/275	12	42	75	50	630	80	31.5	31.5	45	25
VHZ4-12-1250-31.5	210/275					1250					
VHZ4-12-1600-31.5	210/275					1600					
VHZ4-12-2000-31.5	210/275					2000					
VHZ4-12-2500-31.5	275					2500					
VHZ4-12-3150-31.5	275					3150					
VHZ4-12-4000-31.5	275					4000*					
VHZ4-12-1250-40	210/275	12	42	75	50	1250	110	40	40	45	25
VHZ4-12-1600-40	210/275					1600					
VHZ4-12-2000-40	210/275					2000					
VHZ4-12-2500-40	275					2500					
VHZ4-12-3150-40	275					3150					
VHZ4-12-4000-40	275					4000*					

Note:

* Need forced air cooling as rated current up to 4000A

2) ** Product net weight is for reference only.

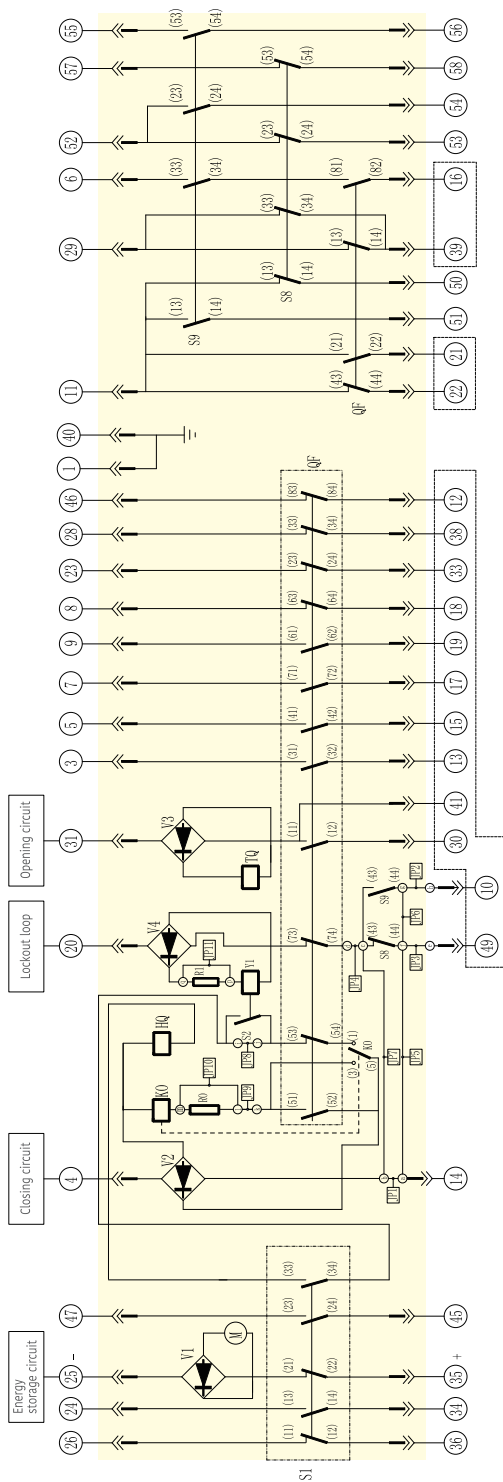
3) Special requirements should consult the manufacturer.

4) Equipped with KYN type cabinet.

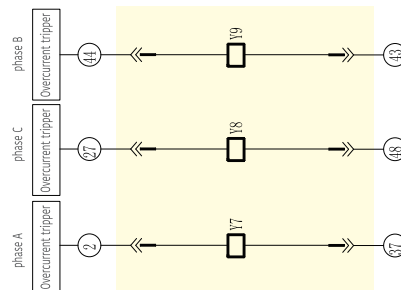
Technical parameters

Rated operating sequence		Switch operating life cycle				MIN\MAX closing time	MIN\MAX opening time	Closing bounce	Opening bounce	allowable wear-thickness for contact	Energy storage time	Arcing time	Weight	
0-0.3s- CO - 180s - CO	0-180s -CO - 180s- CO	Operation mechanism	Vacuum interrupter	Rated current	Full capacity short circuit current								fixed type	Withdrawable type
		times	times	times	times	ms	ms	ms	mm	mm	s	ms	kg	kg
●	●	30,000	30,000	10,000	100	35/70	25/40	≤2	≤2	3	≤10s	2~15	95/105 105/110 155/175 155/175 195 195 195	120/130 120/130 190/200 200/210 295 295 295
●	●	30,000	30,000	10,000	100	35/70	25/40	≤ 2	≤ 2	3	≤10s	2~15	95/105 105/110 155/175 155/175 195 195 195	120/130 120/130 200/220 200/220 295 295 295
●	●	20,000	30,000	10,000	100	35/70	25/40	≤ 2	≤ 2	3	≤10s	2~15	155/175 155/175 155/175 195 195 195	200/220 200/220 200/220 295 295 295

Secondary diagram for withdrawable type with
AC power supply & anti-trip relay



- S9: Auxiliary switch (switchover as VS1 in working position)
S8: Auxiliary switch (switchover as VS1 in test position)
JP1-JP11: jumper
S2: Auxiliary switch (optional)
S1: Auxiliary switch (switchover after spring stored energy)
QF: Auxiliary switch (switchover when switching)
HQ: Closing coil
TQ: Opening coil
R0-R2: resistance
Y7-Y9: indirect overcurrent tripper (optional)
Y1: Lockout solenoid coil (optional)
V1-V4: rectifier
M: energy storage motor
KO: Internal anti-jump relay

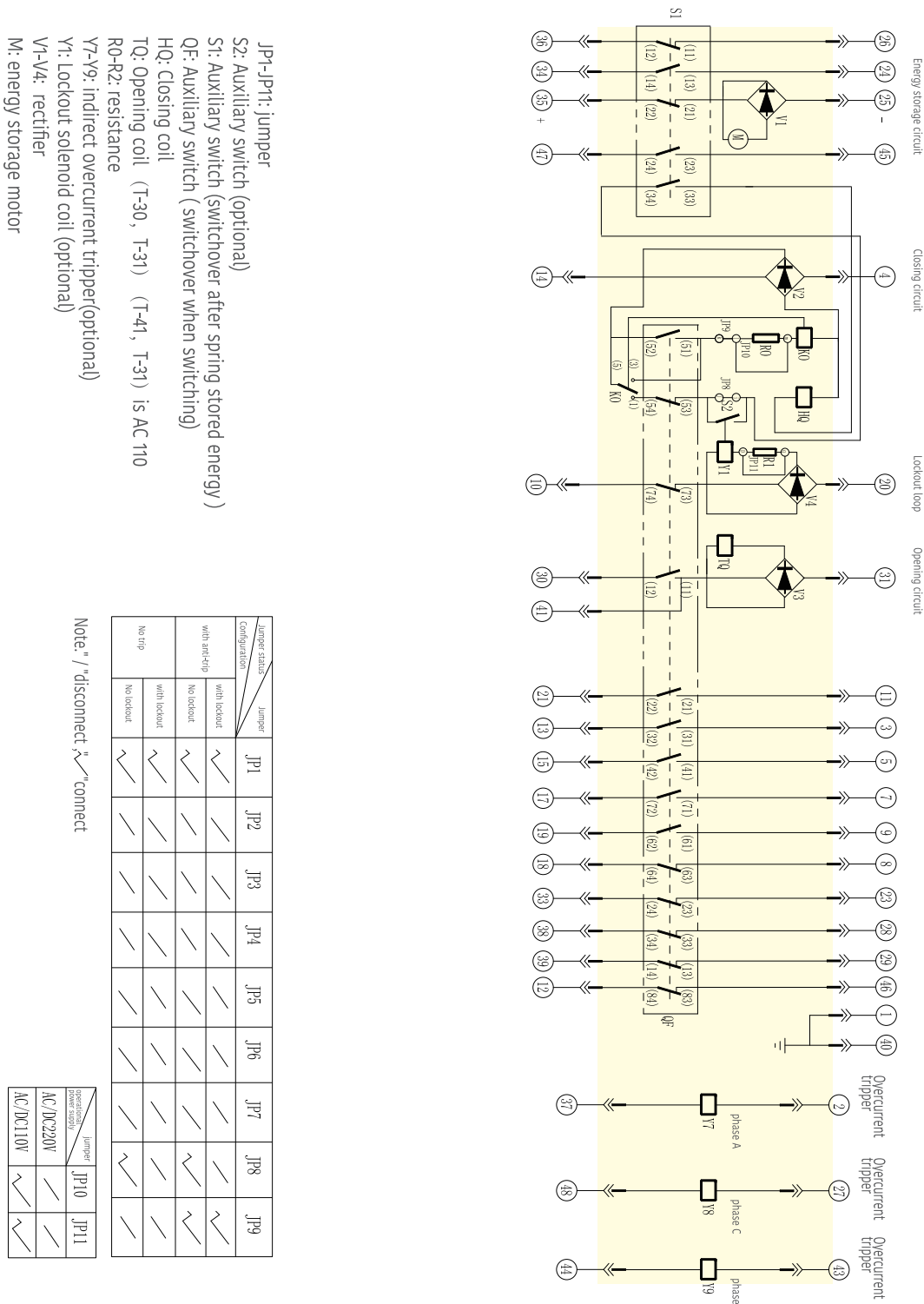


Jumper status Configuration	Jumper										
	JP1	JP2	JP3	JP4	JP5	JP6	JP7	JP8	JP9	JP10	JP11
with anti-trip	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
with lockout	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
No lockout	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
No trip	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

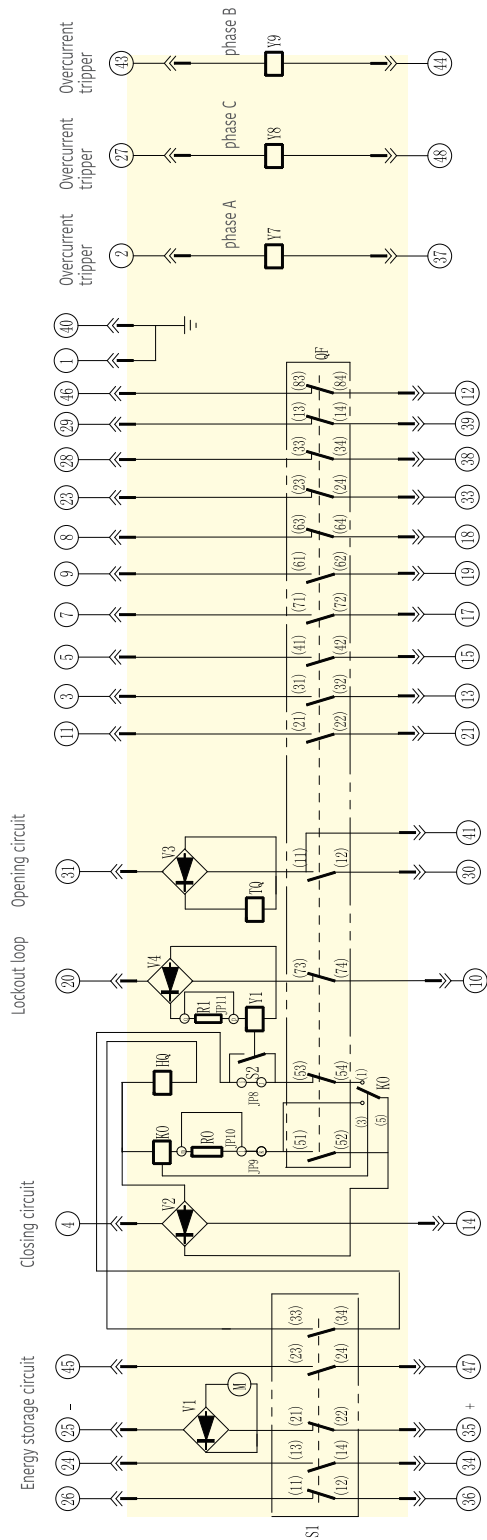
Power supply Voltage	Power supply	
	JP10	JP11
AC / N/220V	✓	✓
AC / N/110V	✓	✓

- Note:
1. Diagram is the location of the withdrawable test for non-energized state
2. Operating for a DC power supply, the polarity in the dashed box should be the same,
The motor should be wired in accordance with the polarity charted.
3. " / "disconnect " / "connect

Secondary diagram for fixed type with
AC power supply & anti-trip relay



Secondary diagram for fixed type with undervoltage AC power supply & anti-trip relay



P1-JP11: jumper

S2: Auxiliary switch (optional)

S1: Auxiliary switch (switchover after spring stored energy)

QF: Auxiliary switch (switchover when switching)

HQ: Closing coil

TQ: Opening coil (T-30, T-31) (T-41, T-31) is AC 110

R0-R2: resistance

Y7-Y9: indirect overcurrent tripper (optional)

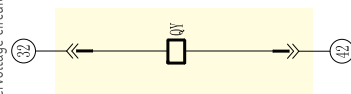
Y1: Lockout solenoid coil (optional)

V1-V4: rectifier

M: energy storage motor

QY: undervoltage coil

undervoltage circuit

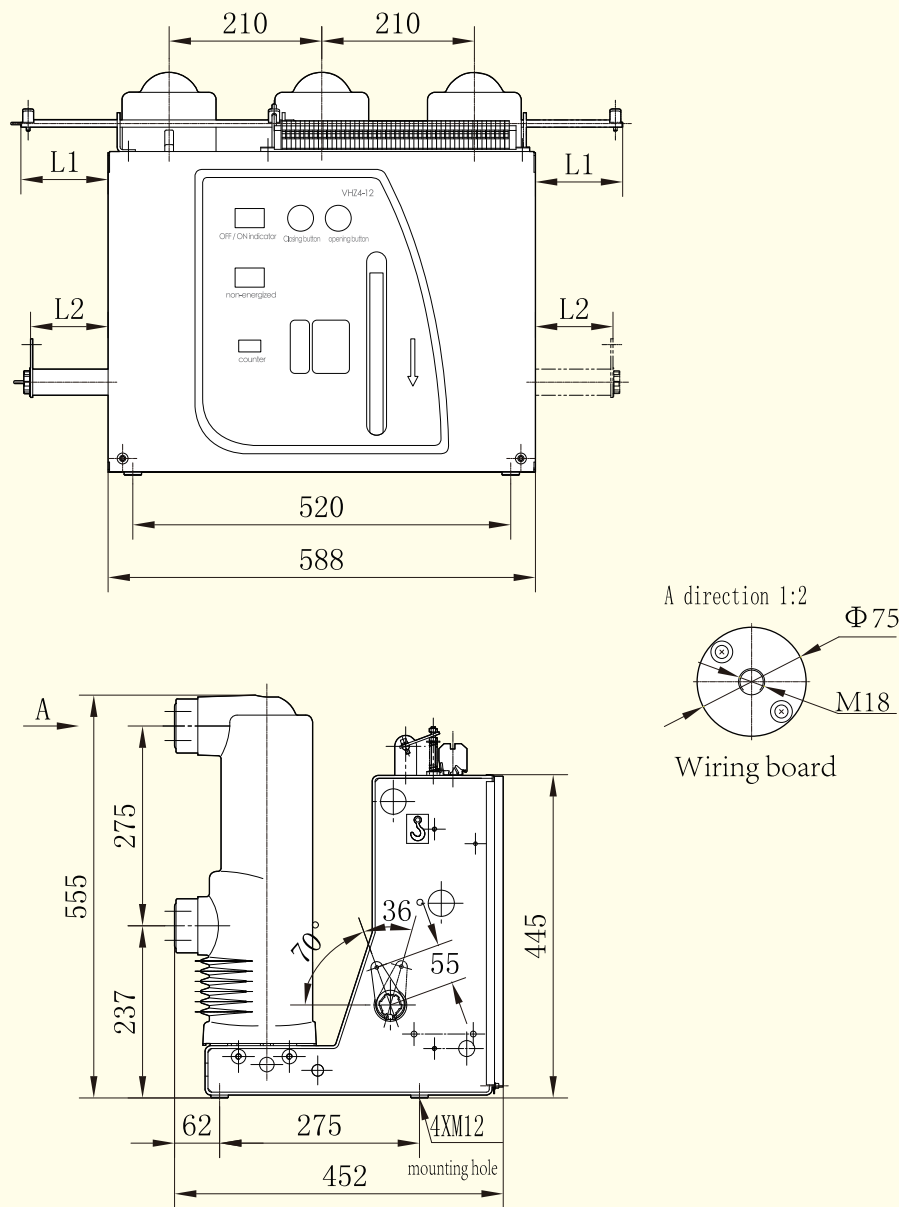


Jumper status Configuration	Jumper										
	JP1	JP2	JP3	JP4	JP5	JP6	JP7	JP8	JP9	JP10	JP11
with anti-trip	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
with lockout	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
No lockout	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
with lockout	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
No lockout	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

Jumper Status supply		JP10	JP11
AC/DC 220V		✓	✓
AC/DC 110V		✓	✓

Note: "✓" disconnect "✓" connect

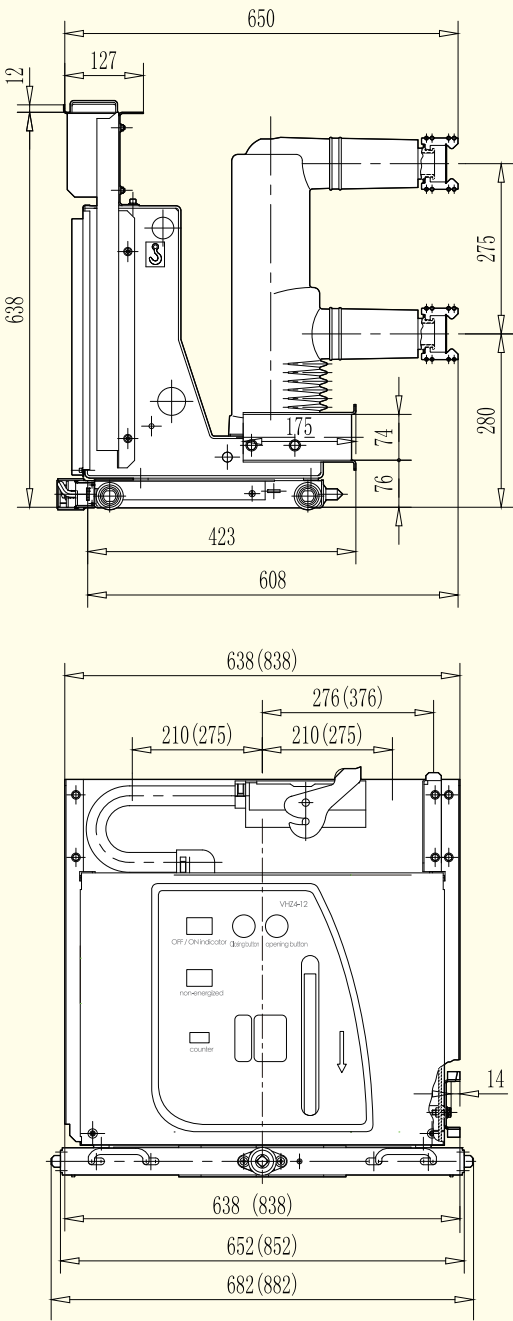
Dimension for Fixed type vacuum circuit breaker



Rated current (A)
Rated short-circuit breaking current (kA)
phase spacing (mm)
top of the mechanism interlock L1 (mm)
body Spindle Interlock L2 (mm)

630	1250	1600
20, 25, 31.5	25, 31.5, 40	31.5, 40
210±1.5		
50, 120, 150, 200 (Interlock left or right out, the length can be customized according to customer requirements)		
36, 106, 136, 186 (Interlock left or right out, the length can be customized according to customer requirements)		

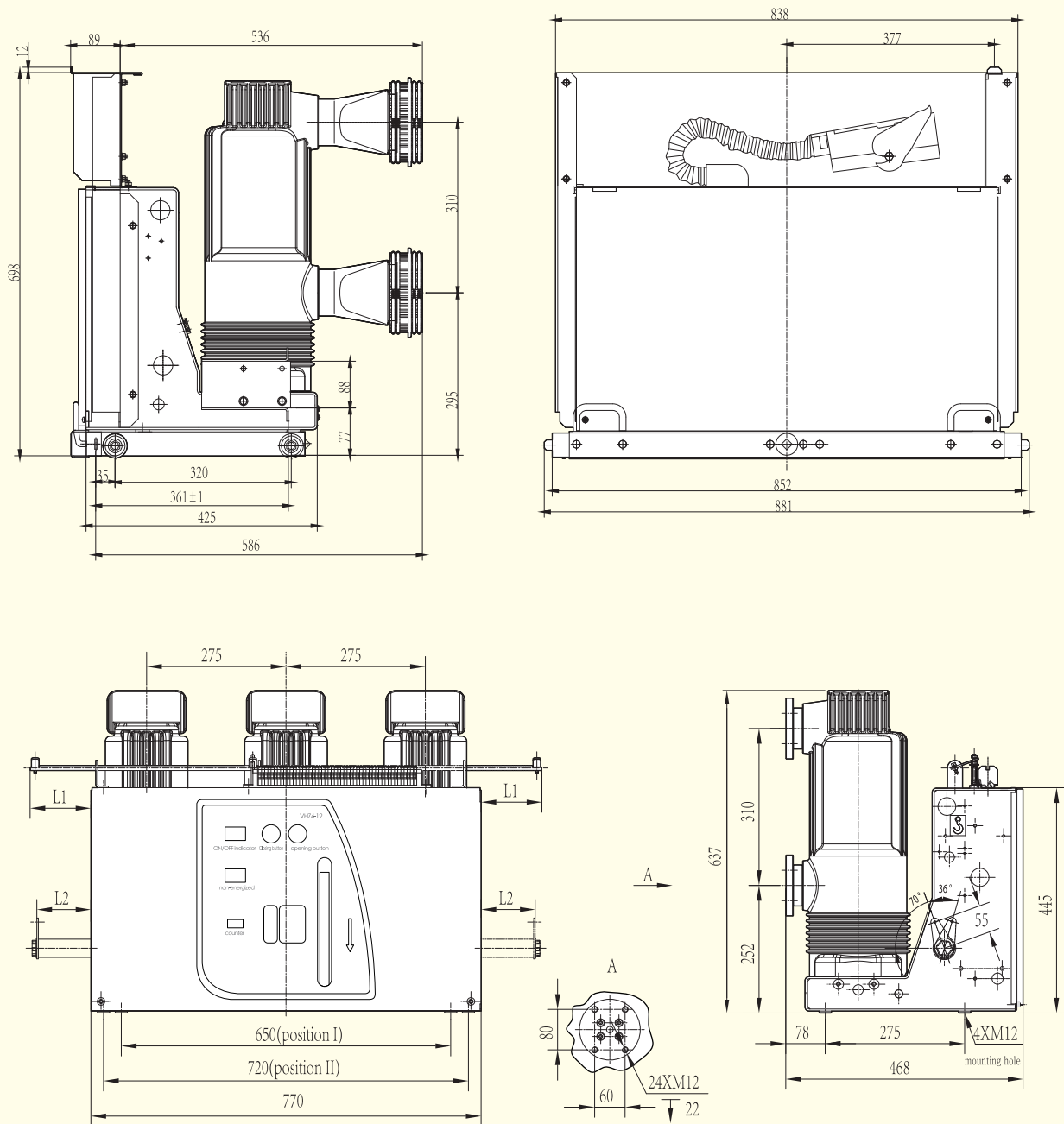
Dimension for withdrawabe type
vacuum circuit breaker



Rated current (A)
Rated short-circuit breaking current (kA)
Match static contact size (mm)
Phase spacing (mm)

630	1250	1600
20, 25, 31.5	25, 31.5, 40	31.5, 40
A35	A49	A55
210±1.5		
(the dimensions in brackets are suitable for drawings with a small current of 1,000mm cabinet and 275mm phase spacing)		

Dimension for vacuum circuit breaker with large current



Rated current (A)

Rated short-circuit breaking current (kA)

Phase spacing (mm)

Top of the mechanism interlock L1 (mm)

Body Spindle Interlock L2 (mm)

1600

31.5, 40

2000

31.5, 40

2500

31.5, 40

275±1.5

3150

31.5, 40

4000

40

50, 120, 150, 200 (Interlock left or right out, the length can be customized according to customer requirements)
36, 106, 136, 186 (Interlock left or right out, the length can be customized according to customer requirements)

Ordering guide

Project _____ Model _____

Order amount _____

Rated voltage: ☒ 12kV Operating mechanism ☒ Spring mechanism Installation method: ☐ withdrawable type ☐ fixed type

pole type	<input type="radio"/> Solid seal pole		
Phase spacing	<input type="radio"/> 150mm	<input type="radio"/> 210mm	<input type="radio"/> 275mm
Rated current	<input type="radio"/> 630A <input type="radio"/> 1250A	<input type="radio"/> 630A <input type="radio"/> 1250A <input type="radio"/> 1600A <input type="radio"/> 2000A	<input type="radio"/> 1600A <input type="radio"/> 2000A <input type="radio"/> 2500A <input type="radio"/> 3150A <input type="radio"/> 4000A
breaking current	<input type="radio"/> 25kA <input type="radio"/> 31.5kA	<input type="radio"/> 25kA <input type="radio"/> 31.5kA <input type="radio"/> 40kA <input type="radio"/> 50kA	<input type="radio"/> 31.5kA <input type="radio"/> 40kA <input type="radio"/> 50kA

Note: the match of specific rated current & breaking current , please see the outline of the specifications in the table.

Grounding mode: ☐ Bottom friction grounding ☐ Both sides groundingON/OFF operating voltage: ☐ DC110V ☐ DC220V ☐ AC110V ☐ AC220VEnergy storage motor voltage: ☐ DC110V ☐ DC220V ☐ AC110V ☐ AC220VSecondary wiring diagram ☐ withdrawable wiring diagram (64 core) ☐ Fixed wiring diagram☐ withdrawable wiring diagram (58 core) ☐ Other wiring diagrams (attached)* function-option: ☐ Closing lockout electromagnet ☐ DC110V ☐ DC220V ☐ AC110V ☐ AC220V☐ Position lockout electromagnet ☐ DC110V ☐ DC220V ☐ AC110V ☐ AC220V☐ Anti-jump relay* Overcurrent tripper: ☐ No overcurrent tripper ☐ 1 Overcurrent tripper ☐ 2 Overcurrent tripper ☐ 3 Overcurrent tripperStandard accessories: ☐ Energy storage handle (standard) ☐ Hand car into the handle (standard)

special requirements: _____

Order party signature: _____ Date: _____ Year _____ Month _____ Day _____

* Non-standard configuration, need additional cost (except for anti-jump relay)

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