



EVC1 Series AC high voltage vacuum contactor

General

EVC1 series vacuum contactor is used in an AC. 50-60 Hz electric power system, with rated working voltage is 7.2kV and 12kV, and rated current of 160A, 250A, 400A, 630A, as earthing-switch when occurs single phase grounding fault. This series adopts split framework, up-and-down layout between the main circuit and controlling circuit, adopts electric-maintaining structure, and vacuum interrupter with ceramic shell.

Normal working conditions

- Ambient temperature: maximum ambient air temperature does not exceed +40°C; average air temperature within 24 hours does not exceed +35°C; minimum ambient temperature does not lower than -15°C.
- Altitude above sea level: altitude above sea level of the installation place does not exceed 2,000M.
- Relative humidity: the relative humidity of the atmospheric air does not exceed 50% when the ambient air temperature is +40°C; higher relative humidity is allowed when the air temperature is lower; daily average relative humidity does not exceed 95%; maximum monthly average relative humidity is 90% when the average air temperature is +20°C in most humid months, having taken into account the condensation dew on the surface of the product due to the temperature variation.
- Working conditions: the places where are without the invasion of rain or snow, without open fire and explosive danger, without chemical corrosions and strong vibration.
- Installation conditions: inclination angle of the installed plane with the vertical plane does not exceed 5°.
- Contamination class: class III.

Type and specification of the product

E VC 1 - 7.2 D / D 250 - 2.5 B
 1 2 3 4 5 6 7 8 9

1. GREGOO
2. Vacuum Contactor
3. Design sequence no.
4. Rated working voltage (KV)
5. Maintaining type*
6. Electro-magnetic operating mechanism
7. Rated working current(A)
8. Max. limit breaking current(KA)
9. No. of enclosure material of vacuum switch tube: B-glass(can be not signed); T-ceramic

Remark:*electric maintaining type can be not signed unless with special requirements.

Structure & working principle

>> Structure and working principle

The high voltage main circuit and low voltage control circuit are arranged in upper and lower sections. This arrangement mode looks apparently, safe, reliable and convenient for installing and maintaining. The moving current-conducting rod of vacuum switch tube is connected with the connecting lever by means of insulator; the connecting lever and the moving armature is fixed/secured on the square axle, attracting and releasing of the armature by the electro-magnetic coil drives the making and breaking process of the moving contacts in the vacuum switch tube. As making/breaking process of the contacts is carried out in the vacuum space, therefore, it has excellent switching characteristics, with long lifetime, both safe and reliable. Its control circuits provide the rectifying equipment and the changeover of picking up and holding of the electro-magnetic coil. It also provides the auxiliary switch of 3a+2b for the user.

>> Vacuum switch tube

Inside the vacuum switch tube of the glass or ceramic enclosure is installed one pair of contacts, made of wear-resistant and low current-cutting off material (see Fig.1), which can satisfy both the breaking performance and reducing the over-voltage caused due to the cutoff current, and raise the lifetime of the switch tube. Bellow inside the switch tube has the function of separating the atmospheric air and making the moving contacts to be able to make axial motion, thus cannot rotate the moving conducting rod; otherwise the bellow will be damaged due to the twist of the rod.

Warning: Vacuum switch tube is the functional actuating component of the contactor. Do not impact it by the external force; otherwise the complete contactor will be damaged/wasted.

Installation, operation, adjustment and maintenance

>> Installation

- a. The contactor should be installed as per the normal working position, of which the inclination angle does not exceed 5° .
- b. Correctly make electric wiring; pay attention to that the control power supply voltage to be in compliance with the control voltage of the contactor.

>> Replacement & adjustment of vacuum switch tube

■ Replacement of vacuum switch tube

- a. Loosen the lock nut of the insulator and switch tube chamber, and remove the insulator.
- b. Remove the soft conductor, and loosen the lock nut on stationary end and the stationary conducting board.
- c. Assemble the switch tube with the opposite procedures as disassembling it.

Notice: Do not make the moving conducting rod relatively rotate with the switch tube when disassembling/assembling the insulator and the soft connections; otherwise the bellows inside the switch tube will be damaged!

■ Adjustment of the stroke

- a. Please see the technical parameters for the stroke of main contact of the vacuum switch tube; and see Fig.1 for the measuring method. Measure the distance h between the moving wiring board and the enclosure when it is under closed state, and then make the contactor be under released state, and measure the distance H between the moving wiring board and the enclosure. The difference of $H-h$ is the stroke. When the contactor leaves the factory for delivery, the total travel and stroke has been adjusted. It does not need to be adjusted again in general condition.
- b. When the stroke is to be adjusted, please refer to Fig.2. First remove the soft connection, loosen the lock nut, and then turn the insulator. Secure the lock nut upon the completion of the adjustment.

Warning: Do not make the bellow be rotated /twisted when secure the lock nut.

■ Upon completion of the adjustment, perform the moving operation test under the following voltage range, the conductor should be capable of reliable work.

- a. Make closing operation for several times under 80% rated control voltage;
- b. Make closing operation for several times under 110% rated control voltage;
- c. Make the contactor be reliably released for several times under 70%-10% rated control voltage.

>> We suggest using the surge voltage absorber, such as R-C resistance capacitor protection or varistor protection, when the contactor is to be used for controlling the inductive loads such as the electric motor etc.

>> The new switch tube should be capable of withstanding the specified withstand test under power frequency. Periodically perform the withstand voltage test during the using process. The withstand voltage should not be less than half of the rated test voltage.

>> During the operating process, keep the contactor in clean; periodically adjust its stroke, and check its structural elements for loosened connections.

Transportation & storage

- During the transportation process, the contactor should not be converted, turned over, strongly vibrated/shocked and collided.
- During the transportation and storage process of the contactor, it cannot suffer the invasion of rain and snow. It should be stored in the warehouse without the invasion of rain and snow, with circulating air, and relative humidity of air not exceeding 85%, and air temperature not higher than $+40^{\circ}\text{C}$ or lower than -30°C .

Unpack & inspection

- Inspect the package for its completeness, and check it for damage.
- Check the contactor if comply with the purchase order, and check the spare parts and attached document if comply with the packing list.
- Make corresponding inspection to the contactor.

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Documents going with the contactor

- Product quality certificate;
- Operating instructions;
- Test record;

Notice when placing the order

Please state the following when placing the order:

- Title, model/specification of the product;
- Rated voltage, rated current and rated control voltage;
- Quantity of product and spare parts;
- Other special requirements.;

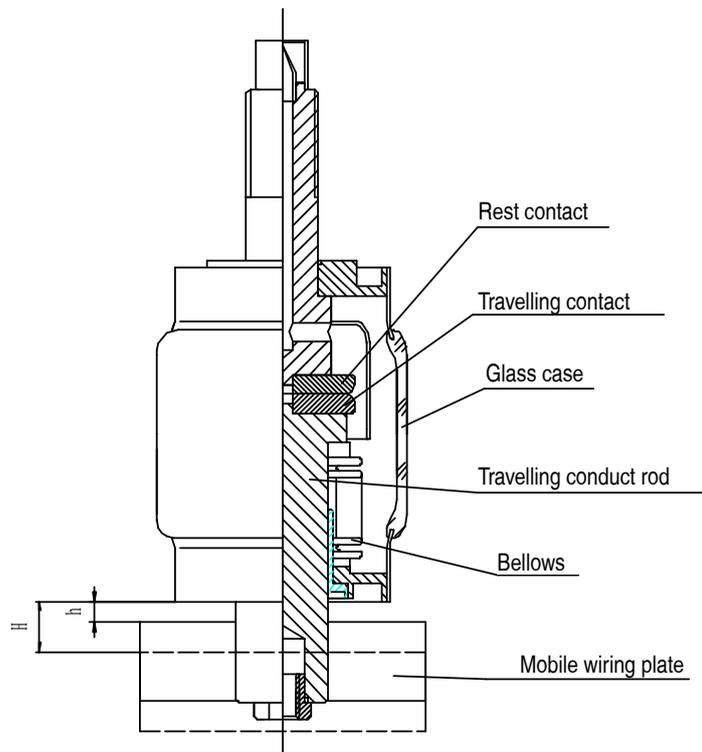


Fig. 1

EVC1-7.2 series AC high voltage single-pole vacuum contactor

EVC1-7.2 series AC high voltage single pole vacuum contactor is designed with the features of composite structure, good appearance, stable functions and so forth.

1. Power frequency withstand voltage:

The main circuit, auxiliary circuit and control circuit shall be able to bear the maximum voltage test at 50/60Hz for one minute. During the test, it shall not be seen of any breakdown or flash, the test voltage is listed in the following table.

Item	Test point	Test voltage 50/60Hz (kV)	remarks
Main circuit	Vacuum break	32	
Control circuit	Control circuit to ground	2.0	Except for transistors and resistance or capacitor
Auxiliary circuit	Auxiliary circuit to ground	2.0	

2. Rated ability for turning on the circuit:

If the power factor $\text{COS}\phi=0.35\pm0.05$, it is able to turn on the circuit 100 times at the current of 10 times of the rated value, under 1.1 times of the rated working voltage.

3. Rated ability for breaking the circuit

If the power factor $\text{COS}\phi=0.35\pm0.05$, it is able to break the circuit 25 times at the current of 8 times of the rated value, under 1.1 times of the rated working voltage.

4. Maximum breaking ability

If the power factor $\text{COS} = 0.35\pm0.05$, it is able to break the circuit 3 times at the current of 10 times of the rated value.

5. Mechanical lifetime: 1000000 times. Electric lifetime: 250000 times. (AC-3).

6. Rated voltage

- a. Rated working voltage of the main circuit of the contactor: 7.2kV.
- b. Rated voltage of the control circuit: DC.110/220V
Other options are available.
- c. Auxiliary circuit: AC. 380V/5A, DC.380V/1A.

7. Rated current

- a. The rated current of the main circuit is 250A, 400A, 630A under rated working voltage and AC-3 working class.
- b. The rated current to generate heat for main circuit is 250A, 400A, 630A.

8. Rated frequency of the contactor is 50/60Hz.

9. Frequency of operation: long term 300 times/ hour, short time 600 times/ hour.

10. Data list for main contact:

Model	Final pressure of the contact	Stroke mm	Overtravel mm
EVC1-7.2/D250-2.5	$\geq 90\text{N}$	5 ± 0.5	2 ± 0.5
EVC1-7.2/D400-4	$\geq 100\text{N}$	5 ± 0.5	2 ± 0.5
EVC1-7.2/D630-6.3	$\geq 120\text{N}$	5 ± 0.5	2 ± 0.5

11. Touch resistance of the main circuit

- EVC1-7.2/D250-2.5 type $\leq 200\mu\Omega$
- EVC1-7.2/D400-4 type $\leq 200\mu\Omega$
- EVC1-7.2/D630-6.3 type $\leq 150\mu\Omega$

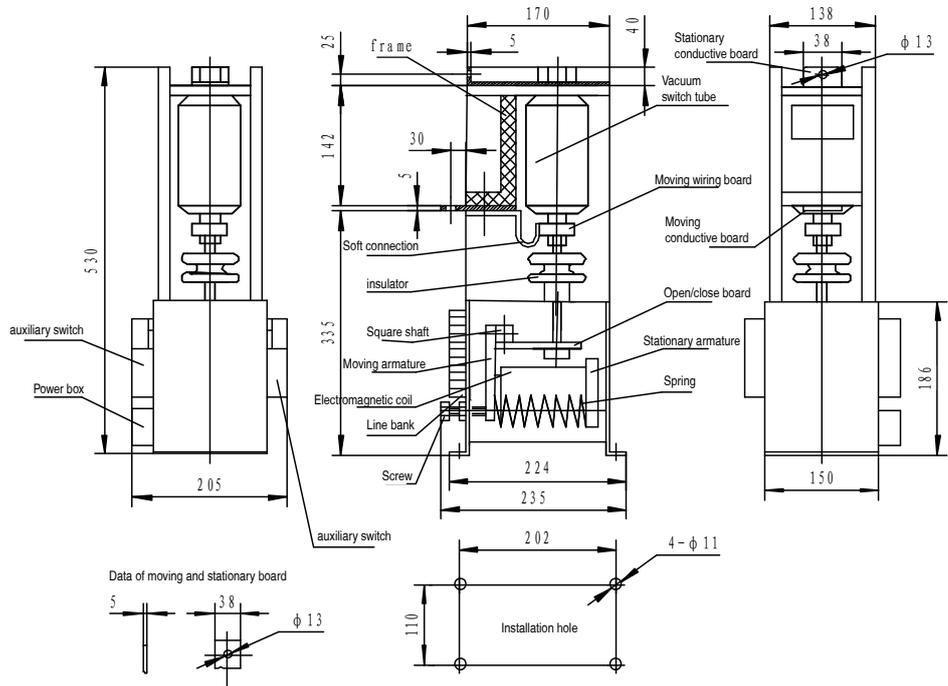
12. Mechanical characteristics

- Action characteristic
- a minimum attracting voltage $\leq 85\%U_s$
- b maximum releasing voltage 10% ~ 70%

Remark: U_s is the rated control voltage.

Mechanical operation characteristics: in accord with the technical standard of our Company.

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EVC1-7.2-12KV/D 160A/1.6;
 250A/2.5; single-pole AC vacuum contactor outline dimension
 400A/4;
 630A/6.3;

EVC1-12kV series AC high voltage single pole vacuum contactor

EVC1-12kV series AC high voltage vacuum contactor is designed with the features of composite structure, good appearance, stable functions and so forth.

1. Power frequency withstand voltage:

The main circuit, auxiliary circuit and control circuit shall be able to bear the maximum voltage test at 50/60Hz for one minute. During the test, it shall not be seen of any breakdown or flash, the test voltage is listed in the following table.

Item	Test point	Test voltage 50/60Hz (kV)	remarks
Main circuit	Vacuum break	42	
Control circuit	Control circuit to ground	2.0	Except for transistors and resistance or capacitor
Auxiliary circuit	Auxiliary circuit to ground	2.0	

2. Rated ability for turning on the circuit:

If the power factor $\cos\phi=0.35\pm0.05$, it is able to turn on the circuit 100 times at the current of 10 times of the rated value, under 1.1 times of the rated working voltage.

3. Rated ability for breaking the circuit

If the power factor $\cos\phi=0.35\pm0.05$, it is able to break the circuit 25 times at the current of 8 times of the rated value, under 1.1 times of the rated working voltage.

4. Maximum breaking ability

If the power factor $\cos = 0.35\pm0.05$, it is able to break the circuit 3 times at the current of 10 times of the rated value.

5. Mechanical lifetime: 1000000 times. Electric lifetime: 250000 times. (AC-3).

6. Rated voltage

- a. Rated working voltage of the main circuit of the contactor: 7.2kV.
- b. Rated voltage of the control circuit: DC.110/220V
- Other options are available. Rated power: picking up \leq 1000VA, holding \leq 100VA.
- c. Auxiliary circuit: AC. 380V/5A, DC.380V/1A.

7. Rated current

- a. The rated current of the main circuit is 250A, 400A, 630A under rated working voltage and AC-3 working class.
- b. The rated current to generate heat for main circuit is 250A, 400A, 630A.

8. Rated frequency of the contactor is 50/60Hz.

9. Frequency of operation: long term 300 times/ hour, short time 600 times/ hour.

10. Data list for main contact:

Model	Final pressure of the contact	Stroke mm	Overtravel mm
EVC1-12/D250-2.5	\geq 90N	7 \pm 0.5	2 \pm 0.5
EVC1-12/D400-4	\geq 100N	7 \pm 0.5	2 \pm 0.5
EVC1-12/D630-6.3	\geq 120N	7 \pm 0.5	2 \pm 0.5

11. Touch resistance of the main circuit

- EVC1-12/D250-2.5 type \leq 200 $\mu\Omega$
- EVC1-12/D400-4 type \leq 200 $\mu\Omega$
- EVC1-12/D630-6.3 type \leq 150 $\mu\Omega$

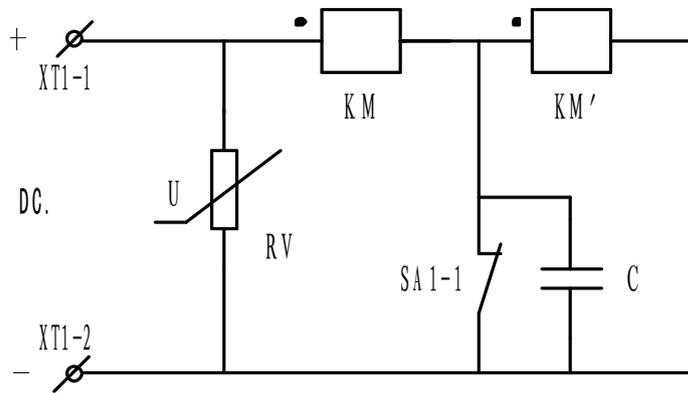
12. Mechanical characteristics

- Action characteristic
- a minimum attracting voltage \leq 85%Us
- b maximum releasing voltage 10%~70%

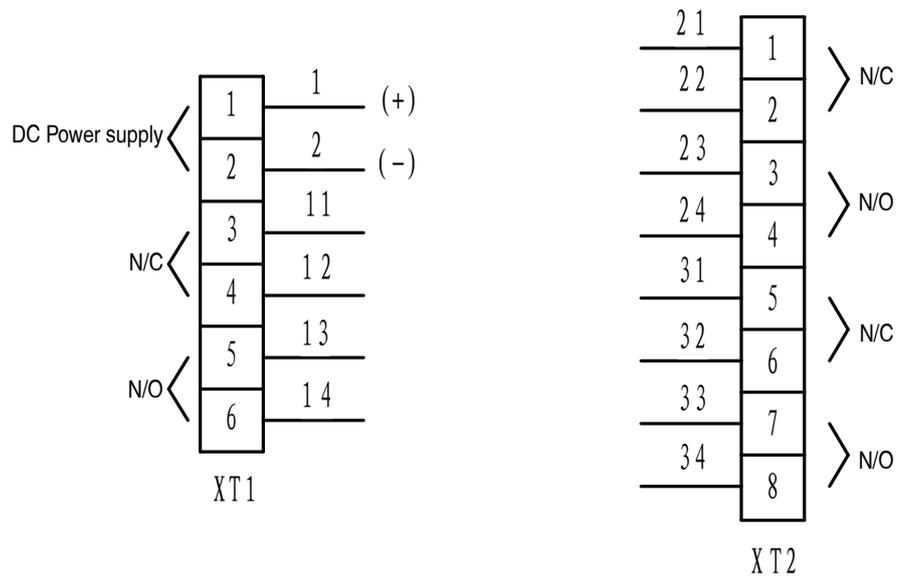
Remark: Us is the rated control voltage.

Mechanical operation characteristics: in accord with the technical standard of our Company.

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XT: wiring terminal; KM+KM': eletromagnetic coil;
SA: auxiliary switch; C:capacitor; RV:varistor resistance
EVC1 series electric scheme



EVC1 series wiring terminal