



EVC9-3.6 Series AC high voltage vacuum contactor

General

EVC9-3.6/D400-4T series vacuum contactor is used in an AC. 50-60 Hz electric power system, with rated working voltage is 3.6kV, and rated current of 400A for direct or remote on-off control and circuit-breaking control of the of the main load. It is especially suitable for the frequently operated electric control applications such as electric motors, transformer, etc. The electric clearance and creepage distance meets the standard of GB3836.3-2000. This series adopts integrated framework, before-and-after 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 not exceeds +40℃; averaged air temperature within 24 hours not exceeds +35℃; minimum ambient temperature to be not lower than -15℃.
- Altitude above sea level: altitude above sea level of the installation place not exceeds 2,000 m.
- Relative humidity: relative humidity of the atmospheric air not exceeds 50% when the ambient air temperature is +40℃; higher relative humidity is allowed when the air temperature is lower, daily averaged relative humidity not exceeds 95%; maximum monthly averaged relative humidity is 90% when the averaged air temperature is +20℃ 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 not exceeds 5°.
- Contamination class: class III.

Type and specification of the product

E VC 9 - 3.6 □ □/D □ - □ □ - □
1 2 3 4 5 6 7 8 9 10 11

1. GREEGOO
2. Vacuum Contactor
3. Design sequence no.
4. Rated working voltage (kV)
5. Maintaining type D: electric holding (or without D)
6. Characteristic's No.*
7. Electro-magnetic operating mechanism
8. Rated working current (A)
9. Rated limit breaking current (kA)
10. Material of vacuum switch tube B: glass (or without B) T: ceramic
11. Control power type and voltage value

Characteristic's No.* can be made according to the requirements of the customer. For example: if the contactor will be used in the ship, its environmental mark is C.

Example of the type and specification as follow: Rated working voltage of main circuit: 3.6kV, rated working current: 400A, maintenance type: electric holding, ceramic switch tube, control voltage: AC.220V

Rated technical data (EVC9-3.6/D400-4T-220AC)

Rated data of contactor as table 1 (Table 1 rated data)

Name		Unit	Data
Main circuit	Rated working voltage (Ue)	kV	3.6
	Rated working current (Ie)	A	160,200,250,400
	Rated thermal current (Ith)	A	160,200,250,400
	Rated making capacity (I)	A	10Ie
	Rated breaking capacity (Ic)	A	8Ie
	Limit breaking capacity	A	10Ie
	Rated short time withstand current and duration	A/s	10Ie/4
Control circuit	Rated voltage (Us)1	V	AC.120V or 220V
	Rated power (Ps)	Electric holding VA	≥ 600/50(attraction/holding)
Auxiliary circuit	type		3a+3b
	Rated value		220V/AC.5A or DC.1A
Rated operating frequency	Long time	Time/h	300
	Short time		600
Mechanical life		10000 time	100
Electric life		10000 time	25(AC-3); 10(AC-4)

Technical requirements as table 2 (Table 2 technical requirements)

Technical requirements			unit	Data
Power frequency withstand voltage	Main circuit	Phase to phase, phase to ground	kV	18
		Vacuum breaks	kV	18
		Secondary circuit to ground	kV	2
Mechanical characteristics		stroke	mm	3±0.5
		Over-travel	mm	1.5±0.5
		Closing time	ms	≤200
		Stationary opening time	ms	≤160
		Three-phase synchronism	ms	≤3
		Closing jump	ms	≤10
Main circuit resistance			μΩ	≤200
Main contact working pressure			N	≥60

Structure & working principle

>> Structure and working principle

This contactor adopts the arrangement structure of H.V. main circuit on the front and L.V. control circuit on the rear. This arrangement mode looks apparently, safe, reliable and convenient for installing and maintaining. The moving current-conducting rod of three-phase vacuum arc-extinguishing chamber is connected with the connecting lever by means of three adjusting screws; the connecting lever and the moving armature is fixed / secured on the square axle. Attracting / releasing of the armature by the electro-magnetic coil drives the making / breaking process of the moving contacts. As the making / breaking process 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 the closing /holding of electro-magnetic coil, and can provide the auxiliary switch of 3a + 3b for the users.

>> Vacuum arc-extinguishing chamber

Inside the vacuum arc-extinguishing chamber of the glass or ceramic enclosure is installed one pair of contacts, made of wear-resistant and low current-cutting off material (see Fig. 2), which can satisfy both the breaking performance and reducing the over-voltage caused due to the cutoff current, and raise the lifetime of the arc-extinguishing chamber. Bellow inside the arc-extinguishing chamber 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 current-conducting rod; otherwise the bellow will be damaged due to the twist of the rod.

WARNING: Vacuum arc-extinguishing chamber 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

- The contactor should be installed as per the normal working position, of which the inclination angle not exceeds 5°.
- 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

1. Replacement of arc-extinguishing chamber

- Remove the soft connection; loosen the adjusting screw and the lock nut of arc-extinguishing chamber, then remove the adjusting screw.
- Loosen the lock nut on stationary end.
- Assemble the arc-extinguishing chamber with the opposite procedures as disassembling it.

Notice: Do not make moving conducting rod to be relatively rotated with the arc-extinguishing chamber when disassembling/assembling the insulator and the soft connections; otherwise the bellows inside the arc-extinguishing chamber will be damaged.

2. Adjustment of the stroke

- Please see the technical parameters of each model of the contactor for the stroke of main contact of the vacuum arc-extinguishing chamber; and see Fig.1 for the measuring method. Measure the distance between the soft connection and end face of the enclosure to be h when it is under closed state, and then make the contactor to be under released state, and measure the distance between the soft connection and the end face

of the enclosure to be H. The difference of H-h is the stroke. The total travel and stroke has been adjusted when the contactor leaves the factory. It does not necessary to be adjusted under normal condition.

- When the stroke is to be adjusted, please refer Fig.2. First, remove the soft connection, loosen the lock nut; secure the moving terminal board (to avoid the bellow inside the arc-extinguishing chamber to be rotated / twisted), turning the adjusting screw can adjust the stroke. Ensure the synchronism between phase and phase when adjusting the stroke; and secure the lock nut upon completion of the adjustment (do not make the bellow to be rotated / twisted when secure the lock nut)

3. Adjustment of synchronism

Use special measuring instrument to carry out the adjustment of synchronism as per the method stated in 2

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

- Make closing/opening operation for several times under 85% rated control voltage;
- Make closing/opening operation for several times under 110% rated control voltage;
- The highest releasing voltage of the contactor should be between 70%~10% of 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.

>> New arc-extinguishing chamber 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 1/2 of the rated withstand voltage value.

>> During 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℃ and not lower than -25℃.

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.

Documents going with the contactor

- Product quality certificate;
- Operating instruction;
- Test record;
- Packing list.

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 requirement.

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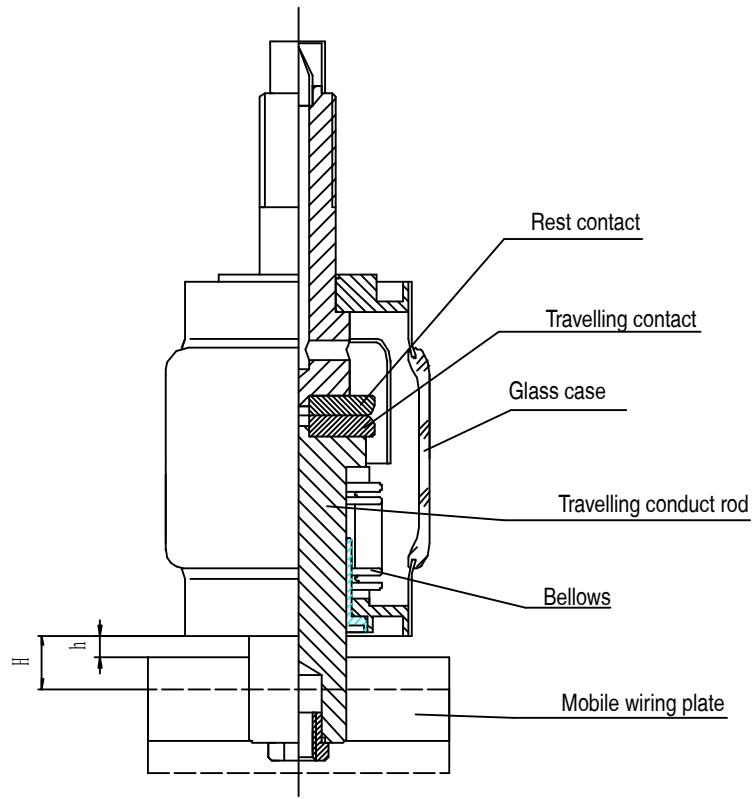
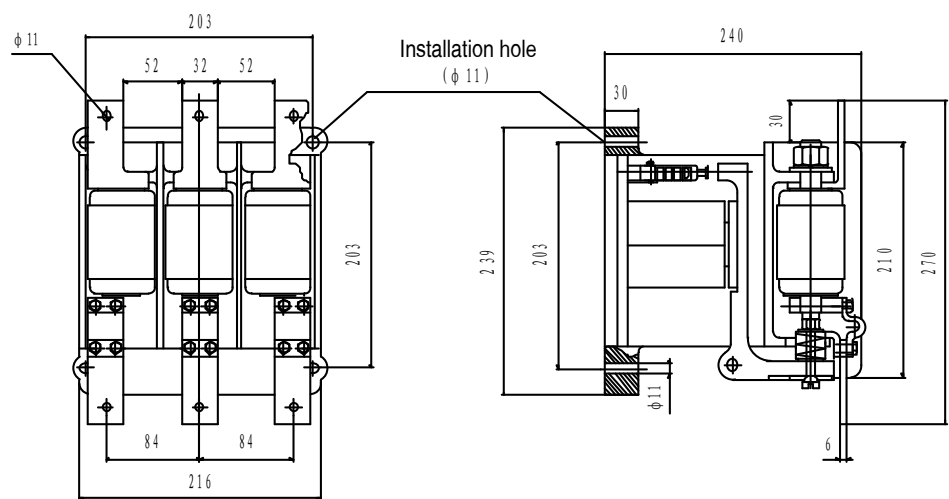
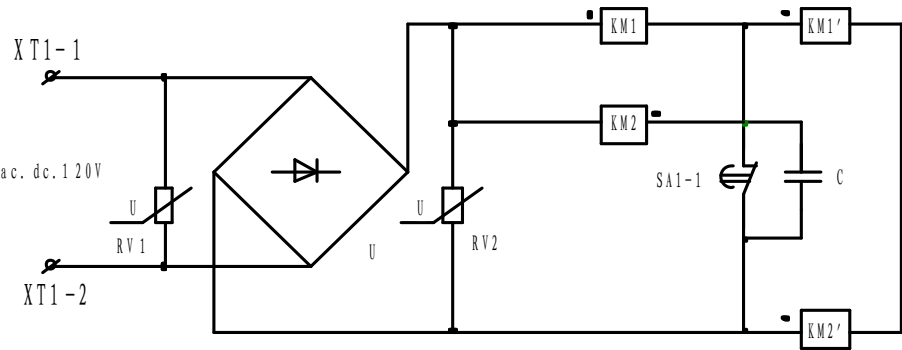


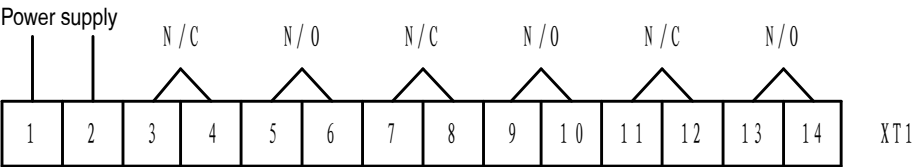
Figure 2



EVC9-3.6KV/400A AC Vacuum contactor outline dimension



U: rectifier bridge; SA: auxiliary switch; RV: varistor resistance;
C: capacitor; KM+KM': coil
Schematic electric diagram of EVC9-3.6kV series AC vacuum contactor



Schematic diagram of wiring terminals of EVC9-3.6kV series AC vacuum contactor