



GVC7-1600/1140V series AC low voltage vacuum contactor

General

GVC7-1600/1140 series AC vacuum contactor is used in an AC. 50-60 Hz electric power system, with rated working voltage of 1140V, and rated current of 1600A, for direct or remote on-off control of the main circuit, disconnect motor rotor winding loop. It is suitable for the electric-controlling condition which needs large current control, under AC-1 and AC-2 operation. This series adopts before-and-after layout between the main circuit and controlling circuit, adopts electric-maintaining structure or machinery-maintaining structure, and vacuum interrupter with glass 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 1,000 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.
- Contamination class: class III.

Type and specification of the product

G VC 7 - 2500A J / 1140V
 1 2 3 4 5 6

1. GREEGOO
2. Vacuum Contactor
3. Design sequence no.
4. Rated working current (A)
5. D: electric holding type; J: mechanical holding type
6. Rated working voltage (V)

Rated technical data

Rated data for the contactor see table 1 (Table 1 rated data)

Name		Unit	Data
Main circuit	Rated working voltage (Ue)	kV	1.14, 2
	Rated working current (Ie)	A	1600,2000,2500
	Rated thermal current (Ith)	A	1600,2000,2500
	Rated making capacity (I)	A	1.5Ie
	Rated breaking capacity (Ic)	A	1.5Ie
Control circuit	Rated voltage (Us) ¹	V	AC. or DC.110/220/380
	Rated power (Ps)	Electric holding	≥ 1000/100(attracting/holding)
		Mechanical holding	≥ 900/600(closing/opening)
Auxiliary circuit	type		3a+3b
	Rated value		380V/AC.5A or DC.1A
Rated operating frequency	Long time	Time/h	300
	Short time	Time/h	600
Mechanical life ²		10000 time	100
Electric life		10000 time	50(AC-1)

Remark: 1 rated control voltage can be made according to the requirements of the user;
 2 for mechanical holding type, interlock device should be replaced per 100,000 times.

Technical requirements for the contactor see table 2 (Table 2 technical requirements)

Technical requirements			unit	Data	
1 min power frequency withstand voltage	Main circuit	Between phases and to earth	kV	4.2	
		Between vacuum breaks	kV	10	
	Secondary circuit to earth		kV	2	
Mechanical characteristics	stroke		mm	3±0.5	
	Over-travel		mm	1.5±0.5	
	Closing time		ms	≤200	
	Fixed opening time		ms	≤160	
			ms	≤60	
	Three-phase synchronism		ms	≤3	
	Closing jump		ms	≤10	
Main circuit resistance			μΩ	le≤2000	2000<le
			μΩ	≤60	≤40
Working pressure of main contact			N	≥100	≥120

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 contactor is mainly composed of vacuum switch tube, insulating frame, insulator, open/close operating mechanism, electro-magnet and base plate; while for the mechanical holding type, the mechanical interlock mechanism should be assembled relatively. The moving current-conducting rod of three-phase vacuum switch tube is connected with the connecting lever by means of adjusting screws; the connecting lever and the moving armature is fixed/secured on the square axle. For the electric holding type, 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. For the mechanical holding type, attracting of the moving armature by the electro-magnetic coil drives the making process of the moving contacts, and the mechanical locking mechanism keeps with the state of closing; the breaking coil forces the mechanical locking mechanism to release and the moving armature drives the moving contacts to open by the function of opening coil. 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+3b 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 vacuum switch tube. Bellow inside the vacuum 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

- The contactor should be installed as per the normal working position, of which the installation surface should be flat and the inclination angle with the vertical should not exceeds 5°.
- The moving wiring terminal should be down after installation
- 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 vacuum switch tube

- Loosen the lock bolt of the soft connection and moving conducting terminal, remove the lock nut of the adjusting screw and vacuum switch tube;

- Remove the adjusting screw, loosen the lock nut on stationary end and the stationary conducting board, and take out the switch tube and remove the soft connection;
- Assemble the vacuum switch tube with the opposite procedures as disassembling it.

Notice: Do not make moving conducting rod to be relatively rotated with the vacuum switch tube when disassembling/assembling the insulator and the soft connections; otherwise the bellows inside the vacuum switch tube 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 switch tube; and see Fig.1 for the measuring method. Measure the distance between the moving wiring plate 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 moving wiring plate 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.
- Please refer to figure 1 in case the stroke needs to be adjusted. Loosening the lock nut and turning the adjusting screw can make it. Tighten the lock nut after adjustment.

Notice: be careful about the twist of the bellows when loosen or tighten the nut.

3. Adjustment of synchronism

Use special measuring instrument to carry out the adjustment of synchronism as per the method stated in 5.2.2.

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

For electric holding series

- 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.

For mechanical holding series

- Make closing operation for several times under 85% rated control voltage;
- Make closing operation for several times under 110% rated control voltage;
- Make the contactor to be reliably released for several times under 65%~120% rated control voltage; it cannot open for three times under 30% rated control voltage.

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

>> During operating process, keep the contactor in clean; periodically adjust its stroke, and check its structural elements for any 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 $+40^{\circ}\text{C}$ and not lower than -25°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.

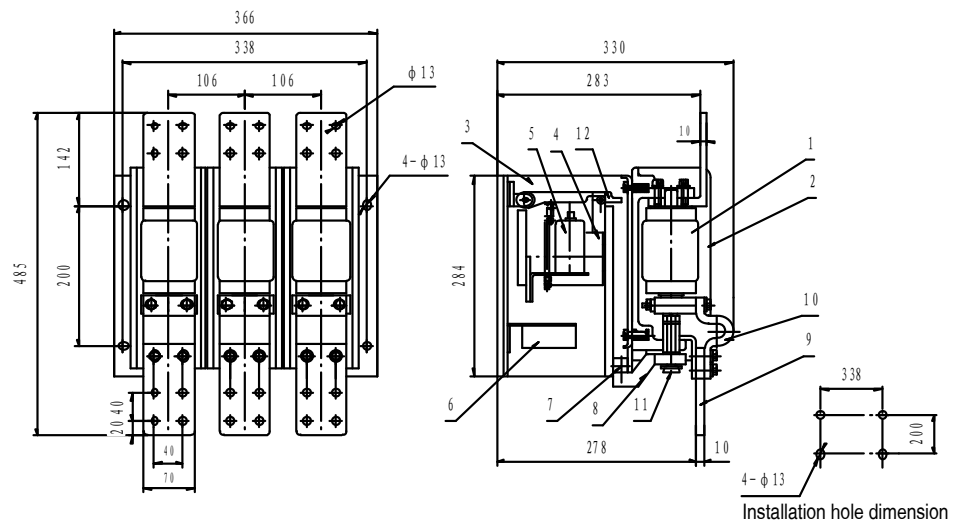
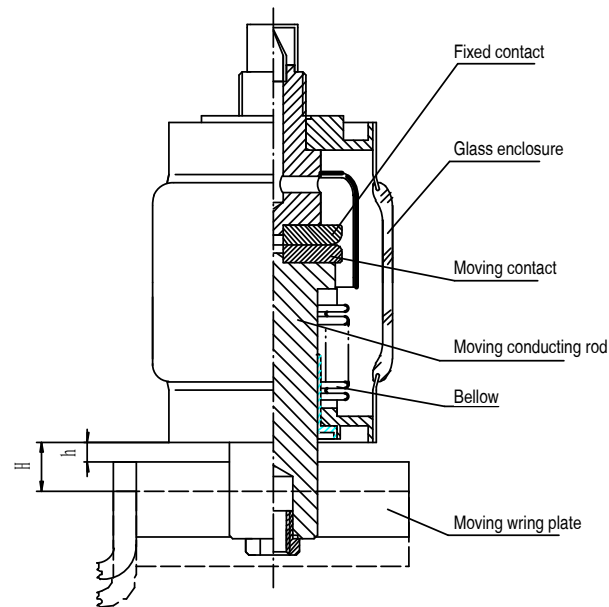
Documents going with the contactor

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

Notice when placing the order

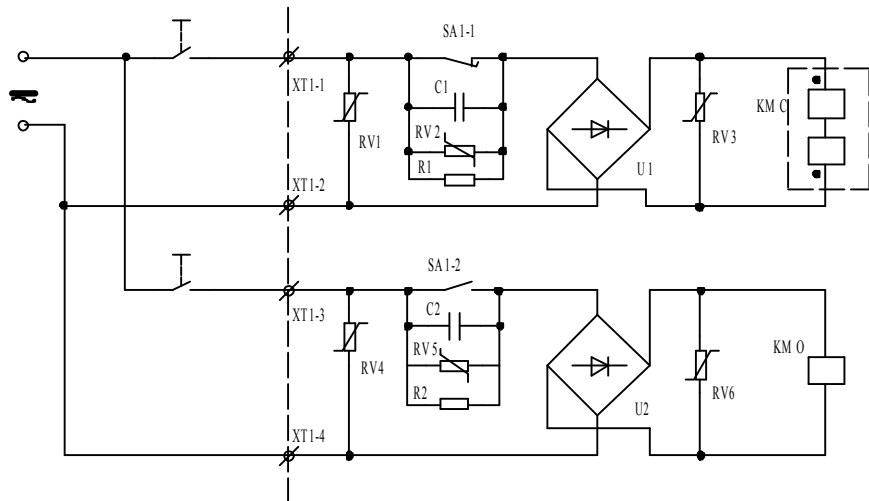
Please state the following when placing the order:

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



GVC7 series AC vacuum contact or structure and outline dimension

1. vacuum switch tube 2. insulating frame 3. base 4. making coil 5. breaking coil 6. combination of power supply 7. rectangular 8. connecting lever 9. moving wiring board 10. soft connection 11. adjusting bolt 12. mechanical interlock
 Remark: breaking coil and latch belongs to mechanical holding type while the electric holding type without such part



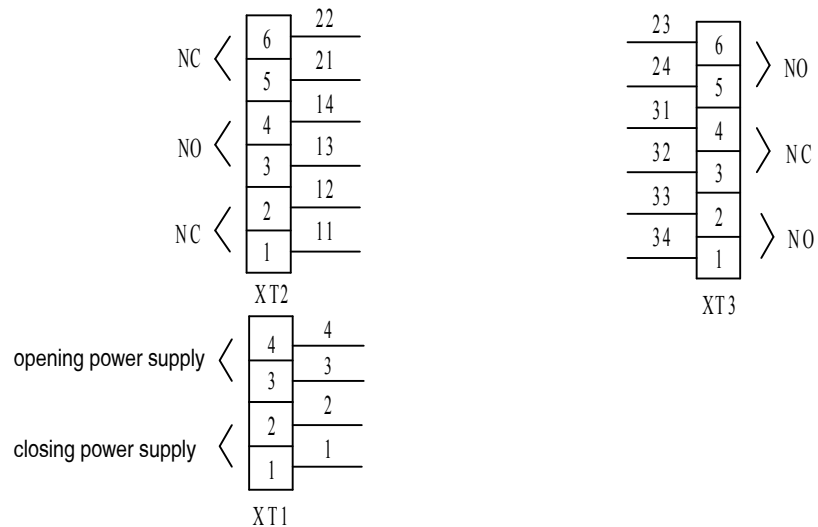
GVC7 series mechanical holding type scheme

In the diagram, the internal wiring is on the right side of the dotted line, the indicating wiring is on the left. The specific wiring type decided by the user

RV1-6: varistor; R1, R2: color-ring resistance; C1, C2: arc-suppression capacitor;

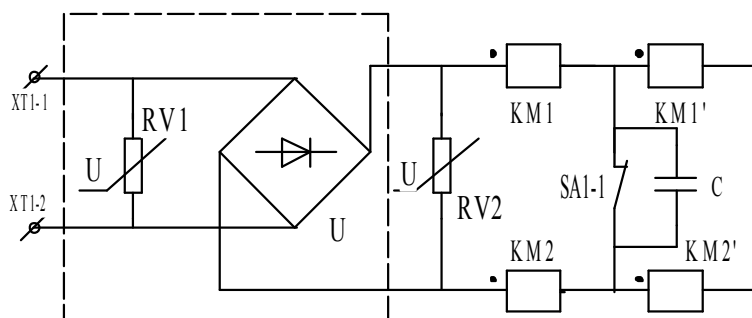
SA1-1, SA1-2: auxiliary switch

U1, U2: rectifier bridge; KMC: closing coil band; KM O: opening coil

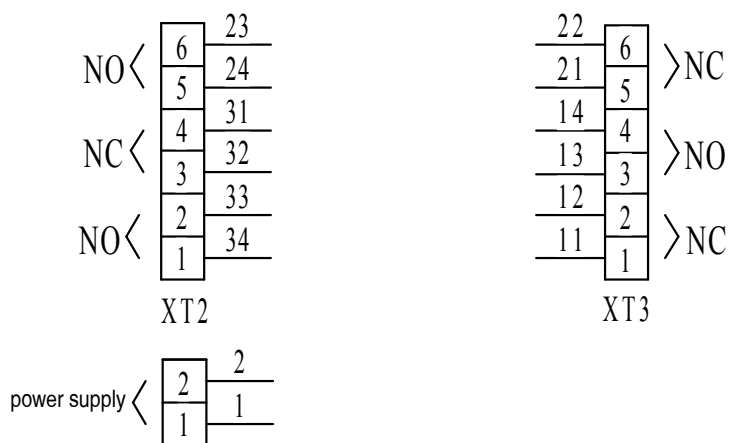


GVC7 series wiring terminal diagram for mechanical holding vacuum contactor

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GVC7-1140V series electric holding vacuum contactor scheme
 XT:wiring terminal; U: rectifier bridge; KM+ KM': electromagnetic coil;
 SA: auxiliary switch; C: capacitor; RV: varistor
 (If the user needs DC to control, there's no rectifier part within the dotted line .)



GVC7-1140V series electric holding vacuum contator diagram for wiring terminal