TGEVC1

Series High-voltage DC Contactor

TGEVC1 Series High-voltage DC Contactor

1 Overview

The TGEVC1 series high-voltage DC contactor (hereinafter referred to as a contactor) has a contact cavity that is encapsulated with epoxy without arc leakage and fire and explosion; the arc extinguishing chamber of the contact is filled with inert gas to prevent contact oxidation, and the contact resistance works stably and reliably to cool the electric arc and reduce contact ablation when the contact is open. The contactor is primarily used in DC circuits with the voltage up to DC1500V and the current less than 600A to remotely turn on and turn off the circuit, and it is widely used in charging piles, new energy vehicles and energy storage systems.

2 Type Designation

TG	EV	C	1	-	□	□	W	□	□	□	□	□
①	②	③	④		⑤	⑥	⑦	⑧	⑨	⑩	⑪	⑫

TGEVC1 Series High-voltage DC Contactor

①	Enterprise code	
②	New energy	
③	Contactor	
④	Design code	
⑤	Rated current (A):	30A ~ 600A (for specific current specifications, refer to the "Product Parameter Table");
⑥	Rated operating voltage:	H: 1000VDC; Default: 750VDC and below;
⑦	Contact polarity:	W: Non-polarity;
⑧	Coil voltage (VDC):	12V, 24V;
⑨	Coil drive mode and load end lead-out mode:	Default: Single coil, 200A and below internal thread products by default; K: Single coil with energy-saving board, 12 ~ 36VDC wide voltage products (the product below 200A shall be customized, and those with 200A and above are optional)
⑩	Aux. contact:	Default: No aux.; A: 1NO;
⑪	Coil lead-out mode:	Default: With a lead-out wire; B: Lead-out wire + Terminal;
⑫	Installation method:	Default: Vertical installation Y: Horizontal installation

TGEVC1 Series High-voltage DC Contactor

3 Main Technical Parameters

Product model	TGEVC1-30A					TGEVC1-50A				
Contact parameters										
Contact form	1H					1H				
Main contactor voltage drop	≤80mV (Under the rated current)					≤80mV (Under the rated current)				
Rated operating current	30A					50A				
Withstand current	30A	Long term				50A	Long term			
	90A	30S				75A	30S			
	150A	10S				250A	10S			
Max. switching current	10 x Ie (At 320VDC: One time)					10 x Ie (At 320VDC: One time)				
Rated operating voltage	750VDC					750VDC				
Max. load voltage	1000VDC					1000VDC				
Mechanical life	2×10^5 times					2×10^5 times				
Electrical life	See the life curve					See the life curve				
Coil parameters (at23 ℃)										
Rated operating voltage (VDC)	Pull – in voltage (VDC)	Release voltage (VDC)	Rated coil resistance (±5%) Ω	Rated operating current (A)	Coil power (W)	Pull – in voltage (VDC)	Release voltage (VDC)	Rated coil resistance (±5%) Ω	Rated operating current (A)	Coil power (W)
12	6 ～ 9	1 ～ 3.6	45	0.3	3.6W	6 ～ 9	1 ～ 3.6	45	0.3	3.6W
24	12 ～ 18	2 ～ 7.2	167	0.15		12 ～ 18	2 ～ 7.2	167	0.15	
Performance parameters										
Pull – in time	≤30mS					≤30mS				
Release time	≤12mS					≤12mS				
Bounce time	≤7mS					≤7mS				
Insulation resistance	Initial state: 1000MΩ (at 1 kVDC)					Initial state: 1000MΩ (at 1 kVDC)				
Dielectric withstand voltage	Between open contacts	3500VAC 1min				Between open contacts	3500VAC 1min			
	Between contact and coil	3500VAC 1min				Between contact and coil	3500VAC 1min			
Shock	Destructive shock	196m/s^2				Destructive shock	196m/s^2			
Vibration	10Hz ～ 500Hz 98m/s^2					10Hz ～ 500Hz 98m/s^2				
Weight	120g					120g				
Outline dimensions	51.3×37.2×48mm					51.3×37.2×48mm				

TGEVC1 Series High-voltage DC Contactor

Table, continued

Product model	TGEVC1-100A					TGEVC1-100H				
Contact parameters										
Contact form	1H					1H				
Main contactor voltage drop	≤80mV (Under the rated current)					≤80mV (Under the rated current)				
Rated operating current	100A					100A				
Withstand current	100A	Long term				100A	Long term			
	140A	400S				140A	400S			
	180A	60S				180A	60S			
Max. switching current	10 x Ie (At 320VDC: One time)					10 x Ie (At 320VDC: One time)				
Rated operating voltage	750VDC					1000VDC				
Max. load voltage	1000VDC					1500VDC				
Mechanical life	2×10^5 times					2×10^5 times				
Electrical life	See the life curve					750VDC： 2×10^3 times		1000VDC： 1×10^3 times		
Coil parameters (at23 ℃)										
Rated operating voltage (VDC)	Pull – in voltage (VDC)	Release voltage (VDC)	Rated coil resistance (±5%) Ω	Rated operating current (A)	Coil power (W)	Pull – in voltage (VDC)	Release voltage (VDC)	Rated coil resistance (±5%) Ω	Rated operating current (A)	Coil power (W)
12	6 ～ 9	1 ～ 3.6	26	0.5	6W	6 ～ 9	1 ～ 3.6	26	0.5	6W
24	12 ～ 18	2 ～ 7.2	96.4	0.25		12 ～ 18	2 ～ 7.2	96.4	0.25	
Performance parameters										
Pull – in time	≤30mS					≤30mS				
Release time	≤12mS					≤12mS				
Bounce time	≤7mS					≤7mS				
Insulation resistance	Initial state: 1000MΩ (at 1 kVDC)					Initial state: 1000MΩ (at 1 kVDC)				
Dielectric withstand voltage	Between open contacts	3500VAC 1min				Between open contacts	3500VAC 1min			
	Between contact and coil	3500VAC 1min				Between contact and coil	3500VAC 1min			
Shock	Destructive shock	$196m/s^2$				Destructive shock	$196m/s^2$			
Vibration	10Hz ～ 500Hz $98m/s^2$					10Hz ～ 500Hz $98m/s^2$				
Weight	190g					190g				
Outline dimensions	53.8×40.2×59.4mm					53.8×40.2×59.4mm				
Aux. contact parameters										
Contact form	One normally open					One normally open				
Contact material	Silver alloy					Silver alloy				
Contact load	Ith：3A，AC -12：125V/3A；DC -12：30V/2A					Ith：3A，AC -12：125V/3A；DC -12：30V/2A				
Min. load	5VDC 100mA					5VDC 100mA				
Contact resistance (initial value)	30mΩmax					30mΩmax				
Insulation resistance	100MΩmin					100MΩmin				
Dielectric withstand voltage	Between terminals	AC600V 50/60Hz 1min				Between terminals	AC600V 50/60Hz 1min			
	Between terminal and uncharged metal	AC1500V 50/60Hz 1min				Between terminal and uncharged metal	AC1500V 50/60Hz 1min			
	Between charged metal and earth	AC1500V 50/60Hz 1min				Between charged metal and earth	AC1500V 50/60Hz 1min			
Vibration	10-55Hz, Double – amplitude 1.5mm					10-55Hz, Double – amplitude 1.5mm				
Shock	Functional shock resistance	$294 m/s^2$				Functional shock resistance	$294 m/s^2$			
	Destructive shock resistance	$980 m/s^2$				Destructive shock resistance	$980 m/s^2$			
Electrical life	Frequency: 1 min / 3 times	3x104 times				Frequency: 1 min / 3 times	3x104 times			
Mechanical life	Frequency: 1 min / 60 times	1x106 times				Frequency: 1 min / 60 times	1x106 times			

TGEVC1 Series High-voltage DC Contactor

Table, continued

Product model	TGEVC1-135A					TGEVC1-135H				
Contact parameters										
Contact form	1H					1H				
Main contactor voltage drop	≤80mV (Under the rated current)					≤80mV (Under the rated current)				
Rated operating current	135A					135A				
Withstand current	135A	Long term				135A	Long term			
	200A	360S				200A	360S			
	300A	60S				300A	60S			
Max. switching current	10 x Ie (At 320VDC: One time)					10 x Ie (At 320VDC: One time)				
Rated operating voltage	750VDC					1000VDC				
Max. load voltage	1000VDC					1500VDC				
Mechanical life	2×10^5 times					2×10^5 times				
Electrical life	See the life curve					750VDC： 2×10^3 times		1000VDC： 1×10^3 times		
Coil parameters (at 23℃)										
Rated operating voltage (VDC)	Pull – in voltage (VDC)	Release voltage (VDC)	Rated coil resistance (±10%) Ω	Rated operating current (A)	Coil power (W)	Pull – in voltage (VDC)	Release voltage (VDC)	Rated coil resistance (±10%) Ω	Rated operating current (A)	Coil power (W)
12	6 ～ 9	1 ～ 3.6	26	0.5	6W	6 ～ 9	1 ～ 3.6	26	0.5	6W
24	12 ～ 18	2 ～ 7.2	96.4	0.25		12 ～ 18	2 ～ 7.2	96.4	0.25	
Performance parameters										
Pull – in time	≤30mS					≤30mS				
Release time	≤12mS					≤12mS				
Bounce time	≤7mS					≤7mS				
Insulation resistance	Initial state: 1000MΩ (at 1 kVDC)					Initial state: 1000MΩ (at 1 kVDC)				
Dielectric withstand voltage	Between open contacts	3500VAC 1min				Between open contacts	3500VAC 1min			
	Between contact and coil	3500VAC 1min				Between contact and coil	3500VAC 1min			
Shock	Destructive shock	196m/s^2				Destructive shock	196m/s^2			
Vibration	10Hz ～ 500Hz 98m/s^2					10Hz ～ 500Hz 98m/s^2				
Weight	190g					190g				
Outline dimensions	53.8×40.2×59.4mm					53.8×40.2×59.4mm				
Aux. contact parameters										
Contact form	One normally open					One normally open				
Contact material	Silver alloy					Silver alloy				
Contact load	Ith：3A，AC -12：125V/3A；DC -12：30V/2A					Ith：3A，AC -12：125V/3A；DC -12：30V/2A				
Min. load	5VDC 100mA					5VDC 100mA				
Contact resistance (initial value)	30mΩmax					30mΩmax				
Insulation resistance	100MΩmin					100MΩmin				
Dielectric withstand voltage	Between terminals	AC600V 50/60Hz 1min				Between terminals	AC600V 50/60Hz 1min			
	Between terminal and uncharged metal	AC1500V 50/60Hz 1min				Between terminal and uncharged metal	AC1500V 50/60Hz 1min			
	Between charged metal and earth	AC1500V 50/60Hz 1min				Between charged metal and earth	AC1500V 50/60Hz 1min			
Vibration	10-55Hz, Double – amplitude 1.5mm					10-55Hz, Double – amplitude 1.5mm				
Shock	Functional shock resistance	294 m/s^2				Functional shock resistance	294 m/s^2			
	Destructive shock resistance	980 m/s^2				Destructive shock resistance	980 m/s^2			
Electrical life	Frequency: 1 min / 3 times	3x104 times				Frequency: 1 min / 3 times	3x104 times			
Mechanical life	Frequency: 1 min / 60 times	1x106 times				Frequency: 1 min / 60 times	1x106 times			

TGEVC1 Series High-voltage DC Contactor

Table, continued

Product model	TGEVC1-150A					TGEVC1-150H				
Contact parameters										
Contact form	1H					1H				
Main contactor voltage drop	≤80mV (Under the rated current)					≤80mV (Under the rated current)				
Rated operating current	150A					150A				
Withstand current	150A	Long term				150A	Long term			
	200A	360S				200A	360S			
	300A	60S				300A	60S			
Max. switching current	10 x Ie (At 320VDC: One time)					10 x Ie (At 320VDC: One time)				
Rated operating voltage	750VDC					1000VDC				
Max. load voltage	1000VDC					1500VDC				
Mechanical life	2×10^5 times					2×10^5 times				
Electrical life	See the life curve					750VDC： 2×10^3 times		1000VDC： 1×10^3 times		
Coil parameters (at 23℃)										
Rated operating voltage (VDC)	Pull – in voltage (VDC)	Release voltage (VDC)	Rated coil resistance (±10%) Ω	Rated operating current (A)	Coil power (W)	Pull – in voltage (VDC)	Release voltage (VDC)	Rated coil resistance (±10%) Ω	Rated operating current (A)	Coil power (W)
12	6 ～ 9	1 ～ 3.6	26	0.5	6W	6 ～ 9	1 ～ 3.6	26	0.5	6W
24	12 ～ 18	2 ～ 7.2	96.4	0.25		12 ～ 18	2 ～ 7.2	96.4	0.25	
Performance parameters										
Pull – in time	≤30mS					≤30mS				
Release time	≤12mS					≤12mS				
Bounce time	≤7mS					≤7mS				
Insulation resistance	Initial state: 1000MΩ (at 1 kVDC)					Initial state: 1000MΩ (at 1 kVDC)				
Dielectric withstand voltage	Between open contacts	3500VAC 1min				Between open contacts	3500VAC 1min			
	Between contact and coil	3500VAC 1min				Between contact and coil	3500VAC 1min			
Shock	Destructive shock	$196m/s^2$				Destructive shock	$196m/s^2$			
Vibration	10Hz ～ 500Hz $98m/s^2$					10Hz ～ 500Hz $98m/s^2$				
Weight	355g					355g				
Outline dimensions	69.5×53.4×65.8mm					69.5×53.4×65.8mm				
Aux. contact parameters										
Contact form	One normally open					One normally open				
Contact material	Silver alloy					Silver alloy				
Contact load	Ith：3A，AC -12：125V/3A；DC -12：30V/2A					Ith：3A，AC -12：125V/3A；DC -12：30V/2A				
Min. load	5VDC 100mA					5VDC 100mA				
Contact resistance (initial value)	30mΩmax					30mΩmax				
Insulation resistance	100MΩmin					100MΩmin				
Dielectric withstand voltage	Between terminals	AC600V 50/60Hz 1min				Between terminals	AC600V 50/60Hz 1min			
	Between terminal and uncharged metal	AC1500V 50/60Hz 1min				Between terminal and uncharged metal	AC1500V 50/60Hz 1min			
	Between charged metal and earth	AC1500V 50/60Hz 1min				Between charged metal and earth	AC1500V 50/60Hz 1min			
Vibration	10-55Hz, Double – amplitude 1.5mm					10-55Hz, Double – amplitude 1.5mm				
Shock	Functional shock resistance	$294 m/s^2$				Functional shock resistance	$294 m/s^2$			
	Destructive shock resistance	$980 m/s^2$				Destructive shock resistance	$980 m/s^2$			
Electrical life	Frequency: 1 min / 3 times	3x104 times				Frequency: 1 min / 3 times	3x104 times			
Mechanical life	Frequency: 1 min / 60 times	1x106 times				Frequency: 1 min / 60 times	1x106 times			

TGEVC1 Series High-voltage DC Contactor

Table, continued

Product model	TGEVC1-200A				TGEVC1-250A			
Contact parameters								
Contact form	1H				1H			
Main contactor voltage drop	≤80mV (Under the rated current)				≤80mV (Under the rated current)			
Rated operating current	200A				250A			
Withstand current	200A	Long term			250A	Long term		
	300A	900S			350A	500S		
	900A	200S			500A	180S		
Max. switching current	10 x Ie (At 320VDC: One time)				2000A (At 320VDC: One time)			
Rated operating voltage	450VDC				450VDC			
Max. load voltage	900VDC				900VDC			
Mechanical life	2×10^5 times				2×10^5 times			
Electrical life	450VDC： 1×10^4 times		750VDC： 1×10^3 times		450VDC： 1×10^4 times		750VDC： 1×10^3 times	
Coil parameters (at 23℃)								
Rated operating voltage (VDC)	Pull – in voltage (VDC)	Release voltage (VDC)	Starting current (A)	Coil power (W)	Pull – in voltage (VDC)	Release voltage (VDC)	Starting current (A)	Coil power (W)
12	≤9	≥1	0.5	6W	≤9	≥1	0.5	6W
24	≤18	≥2	0.25		≤18	≥2	0.25	
48	≤36	≥4	0.125		≤36	≥4	0.125	
Performance parameters								
Pull – in time	≤30mS				≤30mS			
Release time	≤12mS				≤12mS			
Bounce time	≤7mS				≤7mS			
Insulation resistance	Initial state: 1000MΩ (at 1 kVDC)				Initial state: 1000MΩ (at 1 kVDC)			
Dielectric withstand voltage	Between open contacts	3500VAC 1min			Between open contacts	3500VAC 1min		
	Between contact and coil	3500VAC 1min			Between contact and coil	3500VAC 1min		
Shock	Destructive shock	$196m/s^2$			Destructive shock	$196m/s^2$		
Vibration	10Hz ～ 500Hz $98m/s^2$				10Hz ～ 500Hz $98m/s^2$			
Weight	355g				470g			
Outline dimensions	69.5×53.4×65.8mm				80.5×63.9×72mm			
Aux. contact parameters								
Contact form	One normally open				One normally open			
Contact material	Silver alloy				Silver alloy			
Contact load	Ith：3A，AC -12：125V/3A；DC -12：30V/2A				Ith：3A，AC -12：125V/3A；DC -12：30V/2A			
Min. load	5VDC 100mA				5VDC 100mA			
Contact resistance (initial value)	30mΩmax				30mΩmax			
Insulation resistance	100MΩmin				100MΩmin			
Dielectric withstand voltage	Between terminals	AC600V 50/60Hz 1min			Between terminals	AC600V 50/60Hz 1min		
	Between terminal and uncharged metal	AC1500V 50/60Hz 1min			Between terminal and uncharged metal	AC1500V 50/60Hz 1min		
	Between charged metal and earth	AC1500V 50/60Hz 1min			Between charged metal and earth	AC1500V 50/60Hz 1min		
Vibration	10-55Hz, Double – amplitude 1.5mm				10-55Hz, Double – amplitude 1.5mm			
Shock	Functional shock resistance	$294 m/s^2$			Functional shock resistance	$294 m/s^2$		
	Destructive shock resistance	$980 m/s^2$			Destructive shock resistance	$980 m/s^2$		
Electrical life	Frequency: 1 min / 3 times	3x104 times			Frequency: 1 min / 3 times	3x104 times		
Mechanical life	Frequency: 1 min / 60 times	1x106 times			Frequency: 1 min / 60 times	1x106 times		

TGEVC1 Series High-voltage DC Contactor

4 Normal Working Environment

4.1 Temperature: Normal operating temperature: -25°C ~ +70°C

Allowable limit operating temperature: -40°C ~ +80°C

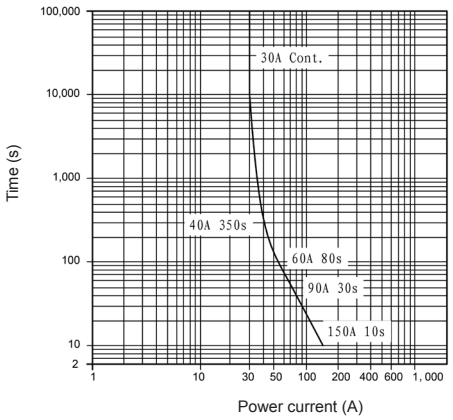
Storage temperature: 85°C max

4.2 Humidity: 5% ~ 85% RH (no icing and condensation)

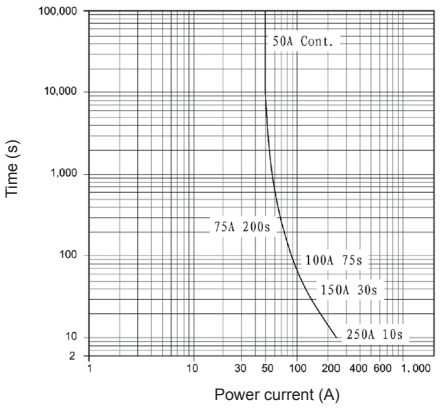
4.3 Atmospheric pressure: 86kPa ~ 106kPa

5 Performance Curve

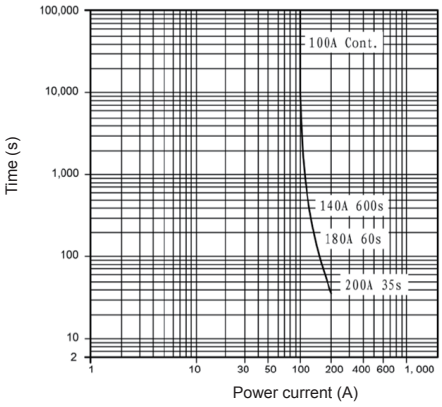
5.1 Current Carrying Capacity Curve



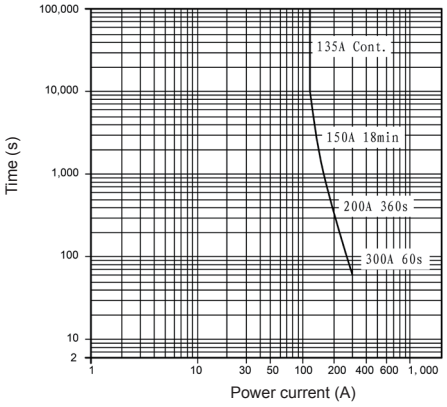
TGEVC1-30A



TGEVC1-50A

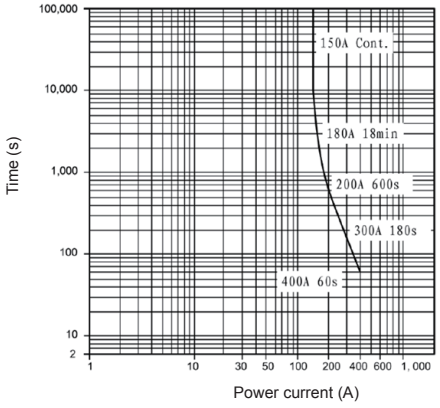


TGEVC1-100A

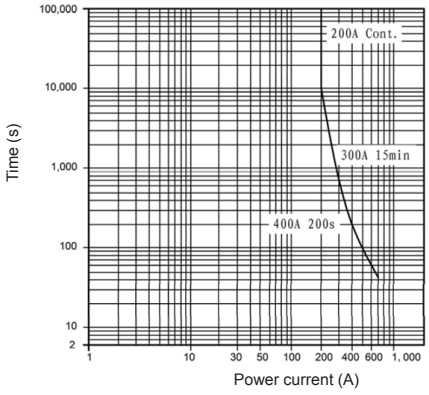


TGEVC1-135A

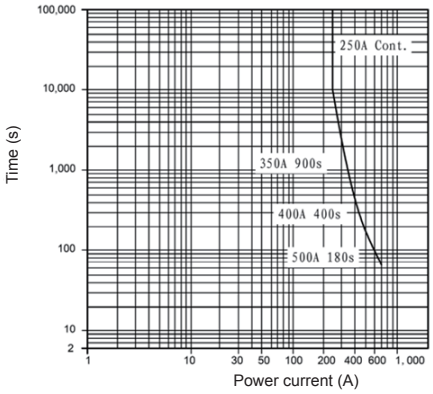
TGEVC1 Series High-voltage DC Contactor



TGEVC1-150A

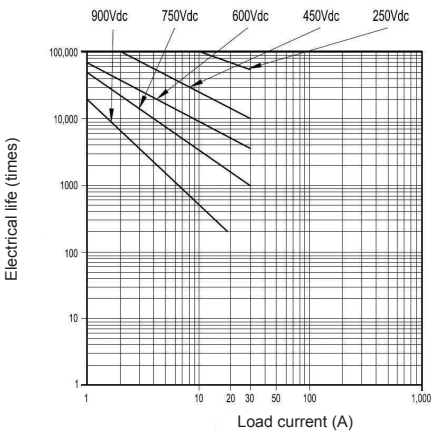


TGEVC1-200A

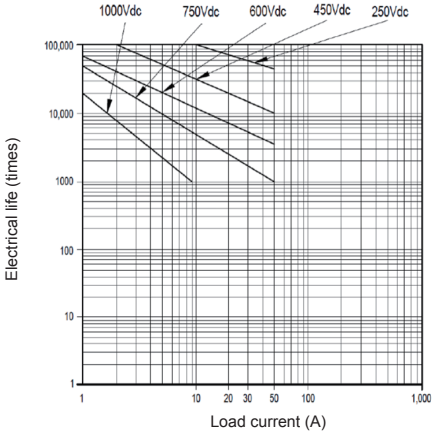


TGEVC1-250A

5.2 Life Curve

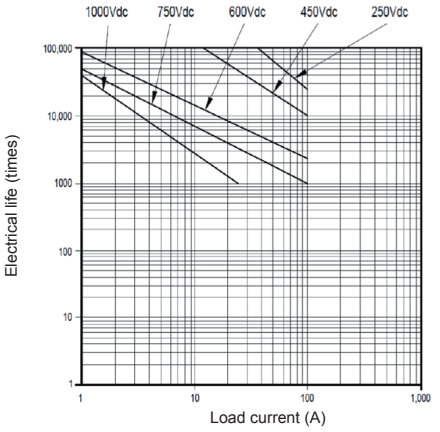


TGEVC1-30A

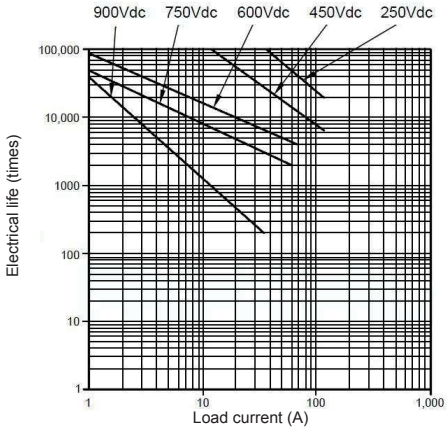


TGEVC1-50A

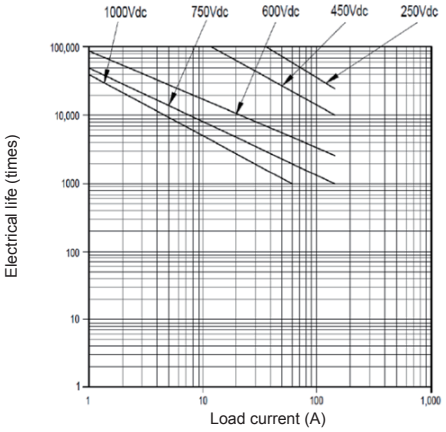
TGEVC1 Series High-voltage DC Contactor



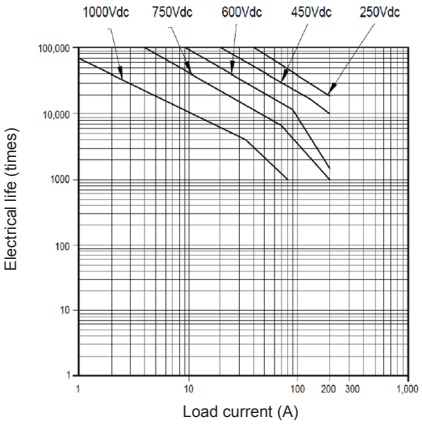
TGEVC1-100A



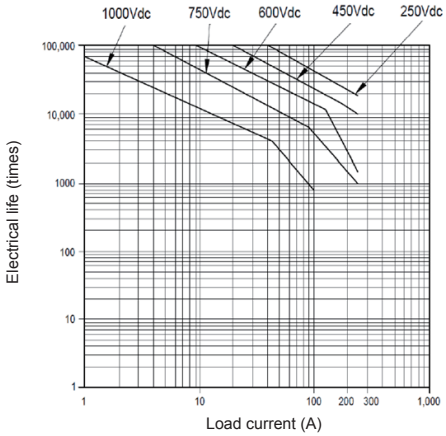
TGEVC1-135A



TGEVC1-150A



TGEVC1-200A

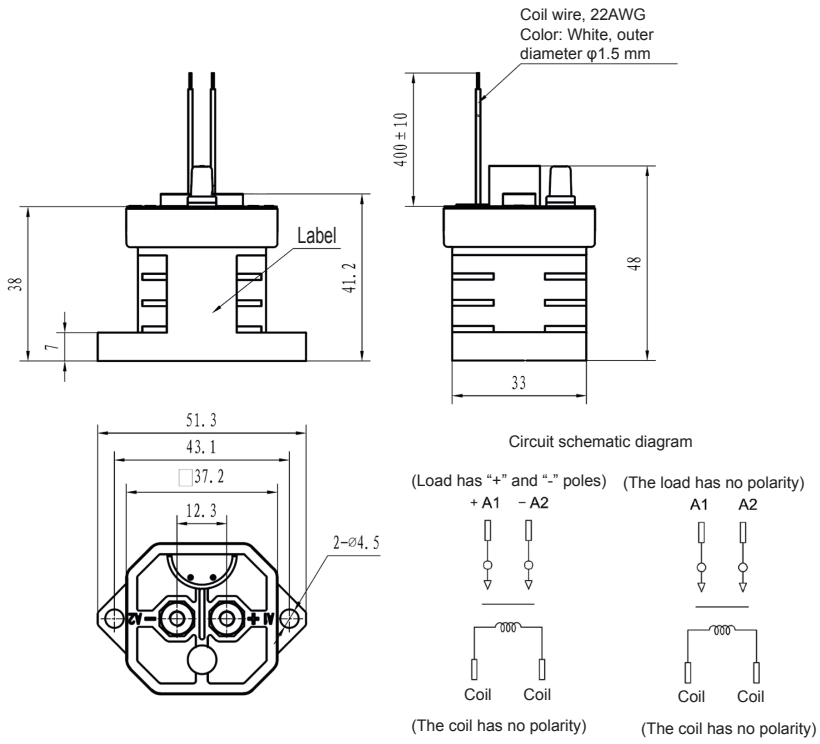


TGEVC1-250A

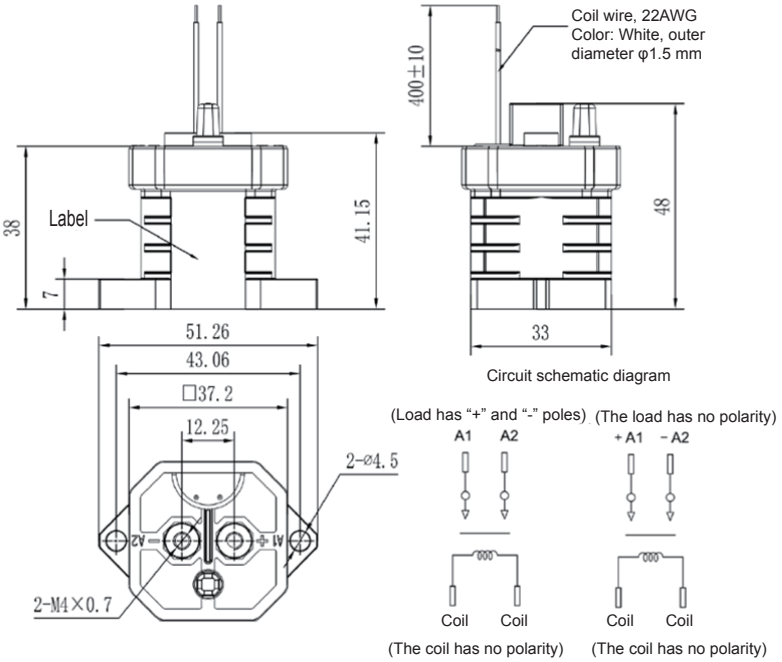
TGEVC1 Series High-voltage DC Contactor

6 Product Outline and Installation Dimensions

6.1 TGEVC1-30 Outline and Installation Dimensions



6.2 TGEVC1-50 Outline and Installation Dimensions



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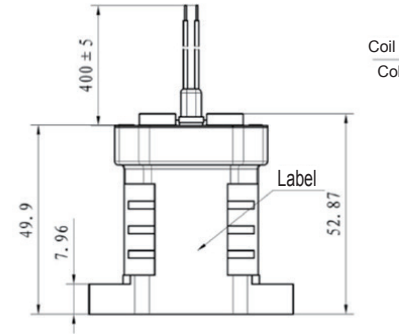
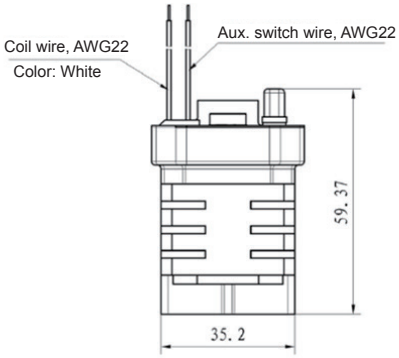
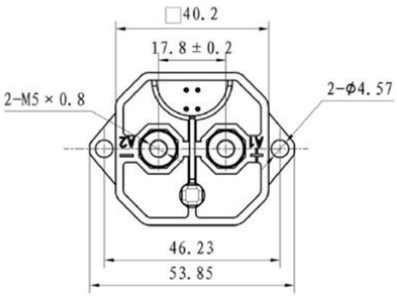
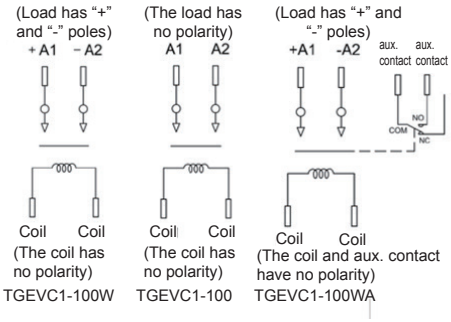
6.3 TGEVC1-100 Outline and Installation Dimensions

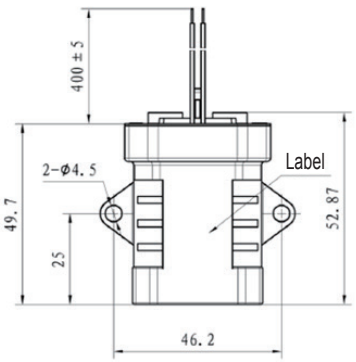


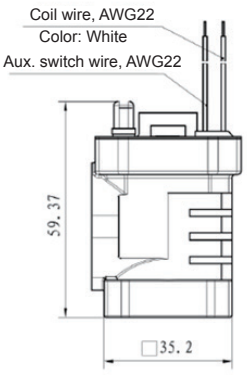


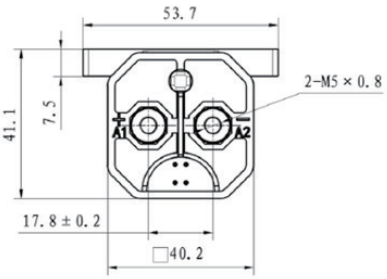


Circuit schematic diagram

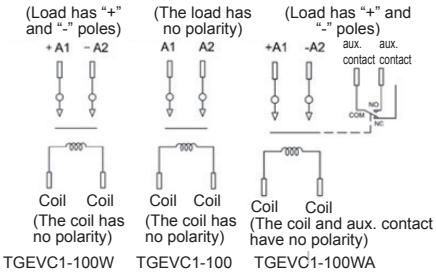








Circuit schematic diagram



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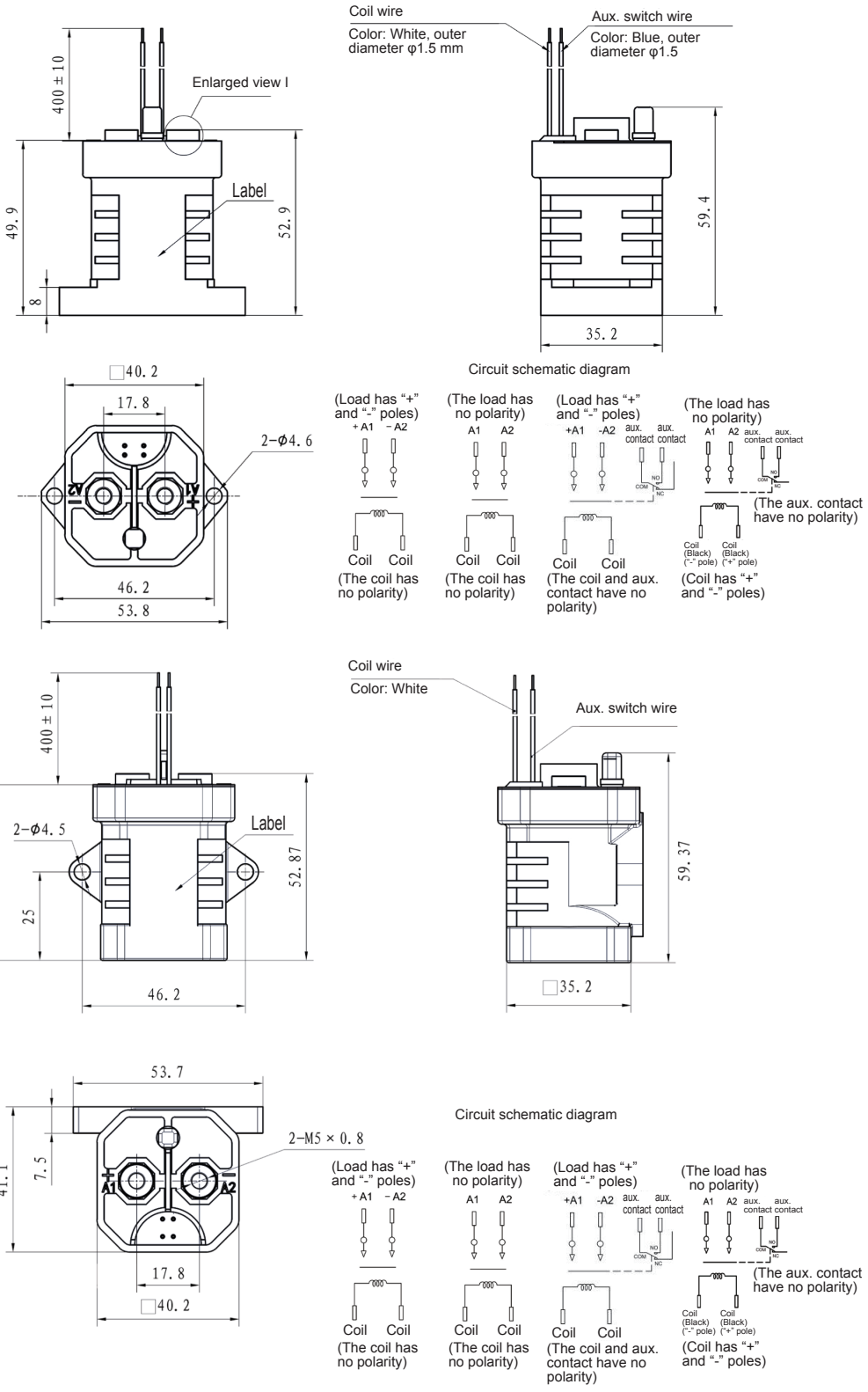
6.4 TGEVC1-135 Outline and Installation Dimensions



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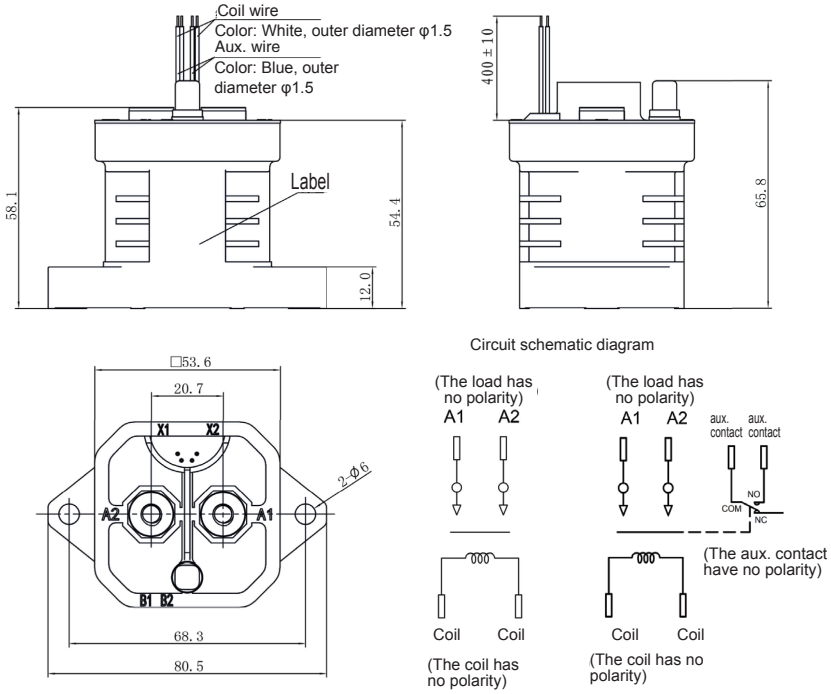
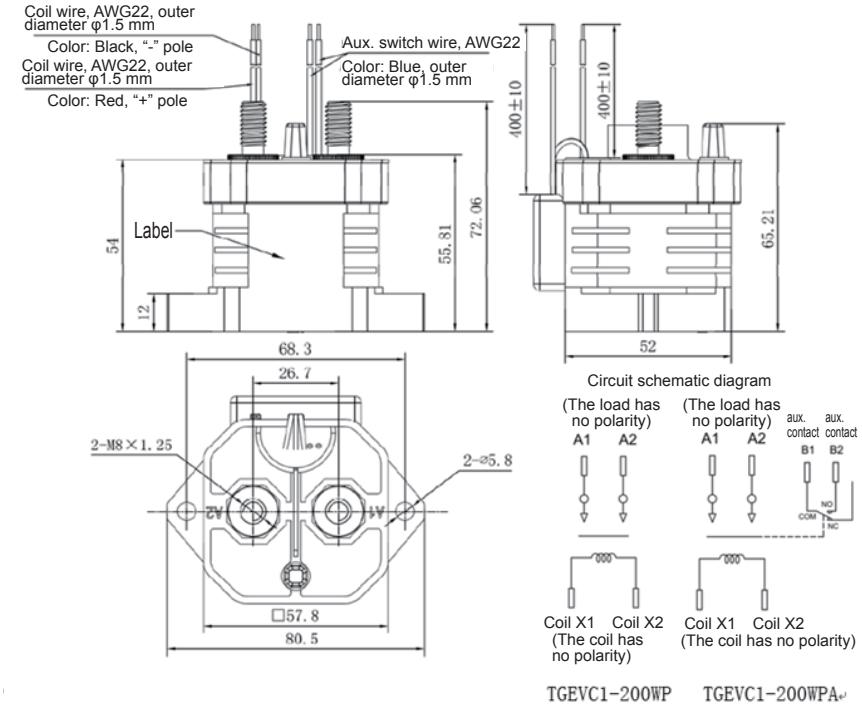
6.5 TGEVC1-150 Outline and Installation Dimensions



6.6 TGEVC1-200 Outline and Installation Dimensions



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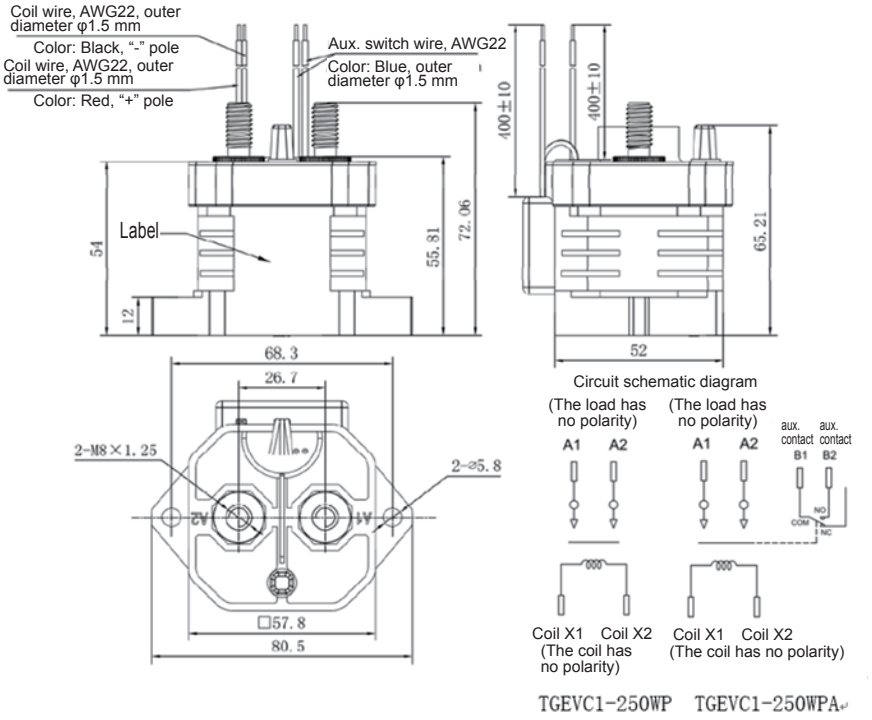
6.7 TGEVC1-250 Outline and Installation Dimensions



7 Ordering Notice

7.1 Installation

7.1.1 Contactor installation: The contactor is tightened firmly with screws.

7.1.2 Mounting screws of main circuit of the contactor: Tightened with screws.

7.2 Connection

7.2.1 The product shall be used under the L/R ≤ 1 ms conditions. When the L/R > 1 ms inductive load (L load) is used, the parallel surge devices are recommended. If diodes are used, please note this may reduce the service life of the contactor.

7.2.2 Please note to refer to the wiring diagram indicated on the product specifications for correct correction of the lead-out end of the load. Incorrect connection may cause unexpected malfunction, abnormal heating, and fire.

7.2.3 Busbar of main circuit: Please select the busbar with the corresponding cross-sectional area according to the rated operating current.

7.2.4 During the installation of the busbar, do not apply excessive load to the terminals, otherwise it may cause an on-off failure. When power-on, please cut off the power supply of the connections such as contactor, connector, and socket in advance before the installation, maintenance, and troubleshooting.

7.3 Operation

7.3.1 The power of the drive circuit of the product coil must be greater than the coil power of the product, otherwise the product cannot work normally.

7.3.2 The power supply waveform of starting the product coil is a square wave.

7.3.3 Do not install the product in a place where there is a strong magnetic field (near magnets or transformers), or near the radiation source.

7.3.4 The contact of this product is located in a sealed cavity, the cavity is filled with gas, and the leakage rate of gas in the cavity is proportional to the temperature of the cavity (the ambient temperature and the temperature rise caused by the contact being energized). Please ensure that the ambient temperature is ranged -40°C ~ 85°C.

TGEVC1 Series High-voltage DC Contactor

Model	Contractor installation		Mounting screw of main circuit of contactor		Sectional area of busbar mm^2
	Screw spec.	Tightening torque	Screw spec.	Tightening torque	
TGEVC1-30A	M4	1.8N•m ～ 2.5N•m	M4	1.8N•m ～ 2.5N•m	≥15
TGEVC1-50A	M4	1.8N•m ～ 2.5N•m	M4	1.8N•m ～ 2.5N•m	≥15
TGEVC1-100A	M4	1.8N•m ～ 2.5N•m	M5	3.5N•m ～ 4.4N•m	≥30
TGEVC1-135A	M4	1.8N•m ～ 2.5N•m	M5	3.5N•m ～ 4.4N•m	≥30
TGEVC1-150A	M4	1.8N•m ～ 2.5N•m	M6	4.5N•m ～ 6.5N•m	≥45
TGEVC1-200A	M5	1.8N•m ～ 3.5N•m	M8	9N•m ～ 12N•m	≥60
TGEVC1-250A	M5	1.8N•m ～ 3.5N•m	M8	9N•m ～ 12N•m	≥75

8 Ordering Notice

Please specify the complete model and name, main circuit load (voltage and current), control circuit (coil voltage), whether the aux. contact is provided or not, energy-saving boards, coil lead out mode, load lead out mode, installation method, and order quantity of the contactor when ordering.

For example: TGEVC1-200/750-12-PABY 100 sets

Meaning: Main circuit 200A, 750VDC, coil voltage 12VDC, double coil energy-saving board, the contact form is a set of normally open aux. contacts, coil lead-out end with lead-out wire + terminal, horizontal installation; order quantity: 100 sets.