

HCG4-4000 DC isolation switch specification

Chapter I Product Overview

1.1 Scope of application

This HCG4-4000 DC Switch-disconnectors is suitable for DC systems with a rated operating voltage of DC1500V and below and a rated operating current of 4000A and below, providing functions of main circuit connection, breaking, and isolation. Typical application scenarios include energy storage, photovoltaics, and DC distribution.

1.2 Product features

Small volume

Special DC two-pole product, with a width of only 259 mm, 40% smaller than traditional AC-to-DC products, helping customers reduce cabinet size.

Low power consumption

Long-term through-flow temperature rise < 50K.

High reliability

Two-pole structure, reducing the system force by 50%, significantly improveing product reliability, with a mechanical durability of up to 10,000 cycles.

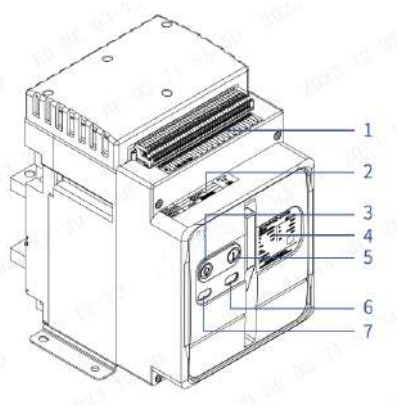
1.3 Standards

UL 489 B, Molded circuit switch

1.4 Structure and indications



UL Development



1. Control circuit wiring instructions
2. Specification label
3. Opening button
4. Nameplate
5. Closing button
6. Energy release and storage indications
7. Opening and closing indications

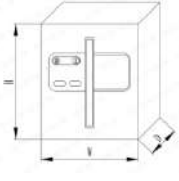
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Model explanation and code specification

1.5 Type selection specifications:			
HCG4-4000 / 4000A 1500V 2P G 1 F2 D2 FC3 Q2 1 AS MK FS11			
	1	2	3 4 5 6 7 8 9 10 11 12 13 14
S/N	Name	Specification and type code	Notes
1	Product type	<input type="checkbox"/> HCG4-4000	
2	Rated current	<input type="checkbox"/> 16-1600A <input type="checkbox"/> 20-2000A <input type="checkbox"/> 25-2500A <input type="checkbox"/> 30-3000A <input type="checkbox"/> 32-3200A, <input type="checkbox"/> 40-4000A	
3	Rated voltage	<input type="checkbox"/> 15-1500V	
4	Number of poles	<input type="checkbox"/> 2: 2P	
5	Installation method	<input type="checkbox"/> G — Fixed	
6	Wiring mode	<input type="checkbox"/> 1 — Horizontal wiring	
7	Shunt trip coil	<input type="checkbox"/> F2-AC200V~250V, <input type="checkbox"/> F3-DC200V~250V, <input type="checkbox"/> F4-DC100V~130V, <input type="checkbox"/> F6-DC24V~30V, <input type="checkbox"/> F7-AC200V~250V (holding type), <input type="checkbox"/> F8-DC200V~250V (holding type)	
8	Motor operating mechanism	<input type="checkbox"/> D2-AC200V~250V, <input type="checkbox"/> D3-DC200V~250V, <input type="checkbox"/> D4-DC100V~130V, <input type="checkbox"/> D6-DC24V~30V	
9	Auxiliary switch	<input type="checkbox"/> FC3 — Four open and four closed, <input type="checkbox"/> FC4 — Five open and Five closed	
10	Undervoltage trip coil	<input type="checkbox"/> Q2-AC200V~250V, <input type="checkbox"/> Q3-DC200V~250V, <input type="checkbox"/> Q4-DC100V~130V, <input type="checkbox"/> Q6-DC24V~30V	
11	Delay time of undervoltage release	<input type="checkbox"/> 0 — instantaneous, <input type="checkbox"/> 1 — 1 s delay, <input type="checkbox"/> 3 — 3 s delay, <input type="checkbox"/> 5 — 5 s delay	Please do not tick if there is no such accessory
12	Button blocking	<input type="checkbox"/> AS — Button blocking	
13	Door frame	<input type="checkbox"/> MK — Door frame	
14	Opening position lock	<input type="checkbox"/> FS11 — one lock and	

1.6 Main technical parameters

Model		HCG4-4000	
Number of poles (P)		2	
Rated current Ie (A)		1600, 2000, 2500, 3000, 3200, 4000	
Rated operating voltage Ue (V)		DC1500	
Rated insulation voltage Ui (V)		DC1500	
Rated impulse withstand voltage Uimp (KV)		12	
Rated short-circuit current (kA)		50	
Short circuit withstand current Icw (kA/s)		150kA/0.2s	
Closing time (ms)		Max. 70	
Lift cycle (times)	Mechanical	Maintenance-free	10,000
	Electrical	DC1500V	500
	External dimensions Inches H × W × D (mm*mm*mm)		394 × 259 × 367
Weight (kg)		40	

Chapter II Scope of Application

2.1 Operating environment

2.1.1 Ambient temperature

Applicable ambient temperature: -40°C to +70°C; the average within 24 h shall not be more than +35°C.

Storage conditions: The air temperature is -40°C~+80°C.

Derating not required in high temperature environment.

Table 1

Ambient temperature	+55°C	+60°C	+65°C	+70°C
Current compensation constant	1	1	1	1

2.1.2 Atmospheric environmental conditions

The relative air humidity at a maximum temperature of +40°C should not exceed 50%. A higher humidity is allowed at a lower temperature, but special measures should be taken to address occasional condensing due to temperature fluctuation.

2.1.3 Altitude

The applicable altitude for installation is up to 5,000 m, and the insulation and current shall not be derated.

Table 2

Altitude	2000m	3000m	4000m	5000m
Insulation compensation constant	1	1	1	1
Current compensation constant	1	1	1	1

2.2 Anti-corrosion Level

Salt spray level: Level 2

2.3 Pollution degree

Pollution level : Level 3

The Switch-disconnectors can be operated in the industrial environment specified in IEC 60664-1.

However, we still recommended that it shall be installed in a switchgear with suitable temperature and no excessive dust pollution.

2.4 Shockproof requirements

◆ The Switch-disconnectors can ensure resistance to electromagnetic or mechanical shock, and has passed the IEC 60721-3-3 standard test;

- ◆ Amplitude: ± 1.5 mm (2 Hz - 9 Hz)
- ◆ Constant acceleration: 5 m/s^2 (9 Hz - 200 Hz)

Super strong shock may result in damage to the parts, and impact the reliable action of the Switch-disconnectors.

2.5 Installation conditions

With the vertical gradient no more than 5° , the Switch-disconnectors shall be installed in places without explosion danger, conductive dust or the possibility of corroding metal and damaging the insulation.

2.6 Installation category






The installation category of the Switch-disconnector's main circuit and power transformer primary coil is IV; the rest auxiliary circuit and control circuit installation category is III.

2.7 Protection class


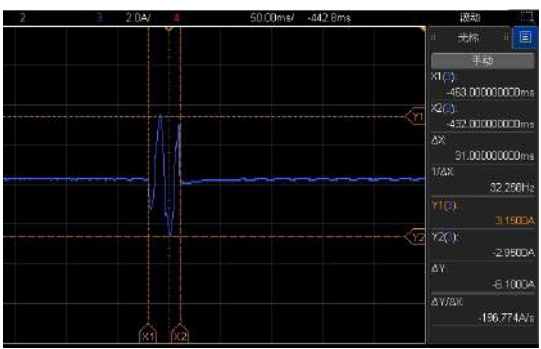

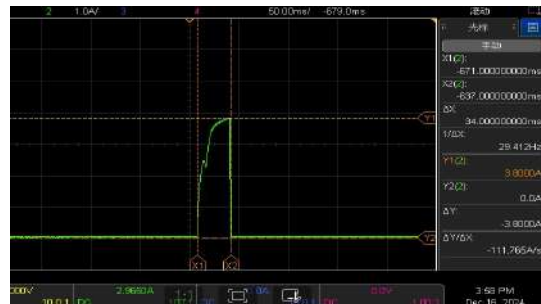
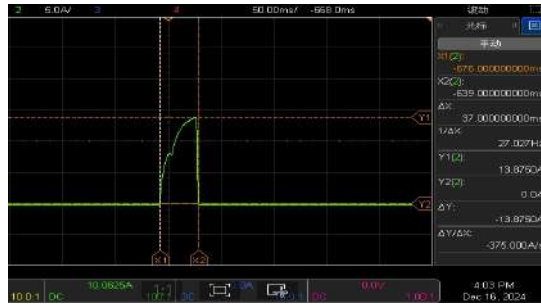

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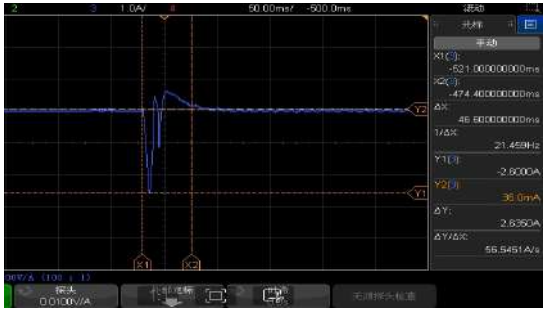
Chapter III Accessories

3.1 Closing coil


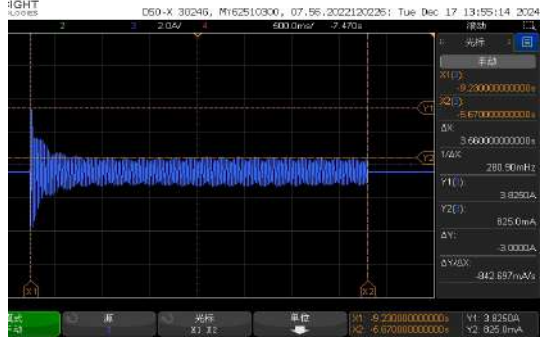

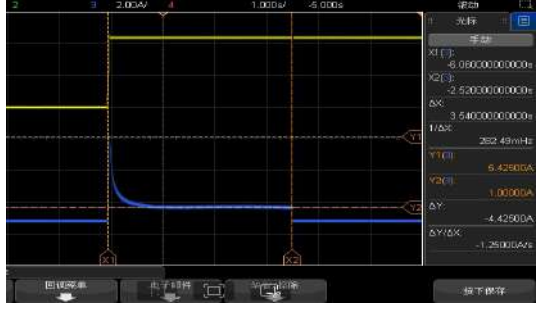

Illustration	Rated voltage (V)	Operation voltage (Ue)	Instantaneous power (W、VA)	Waveform
	AC 200~250	0.85 - 1.1	490	
	DC 200~250		519	
	DC 100~130		418	
	DC 24~30		333	

3.2 Shunt trip coil


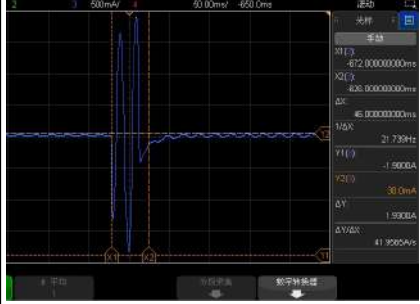
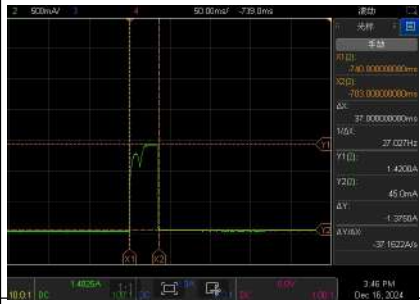


Illustration	Rated voltage (V)	Operation voltage (Ue)	Holding power (W、VA)	Instantaneous power (W、VA)	Waveform
	AC 200~250	0.7 - 1.1	/	490	
	DC 200~250		/	519	
	DC 100~130		/	418	
	DC 24~30		/	333	
	DC 200~250 (Holding type)		4.4	506	


	AC 200~250 (Holding type)		5.5	404	
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3.3 Motor operating mechanism


Illustration	Rated voltage (V)	Operation voltage (Ue)	Steady-state power (W、VA)	Instantaneous power (W、VA)	Waveform
	AC 200~250	0.85 - 1.1	128	595	
	DC 200~250		121	588	
	DC 100~130		110	596	
	DC 24~30		126	612	

3.4 Undervoltage trip coil


Illustration	Rated voltage (V)	Operating power(W、VA)	Instantaneous power (W、VA)	Waveform
	AC 200~250	4.7	296	
	DC 200~250	9.9	312	
	DC 100~130	8	550	
	DC 24~30	0.6	286	

	Rated voltage (V)	AC200~250	DC 200~250	DC 100~130	DC 24~30	
	Operation voltage (V)	(0.35~0.7)Ue				
	Reliable switching voltage	(0.85~1.1)Ue				
	Reliable repelling switching voltage	≤0.35Ue				
	Delay time	Instantaneous, 1 s, 3 s, 5 s				


3.5 Auxiliary switch

	Conventional heating current (A)	6
	Rated insulation voltage U_i (V)	660
	Capacity	AC-15: 380V 0.95A DC-13: 220V 0.63A


3.6 Opening position lock

	It locks the disconnecting switch in the opening position to ensure that it cannot be closed.
	<p>One lock and one key: One disconnecting switch with one lock and one key</p> <p>Two locks and one key: Two disconnecting switches with two locks and one key</p> <p>Three locks and one key: Three disconnecting switches with three locks and one key</p> <p>Three locks and two keys: Three disconnecting switches with three locks and two keys</p> <p>Five locks and three keys: Five disconnecting switches with five locks and three keys</p>

3.7 Button blocking

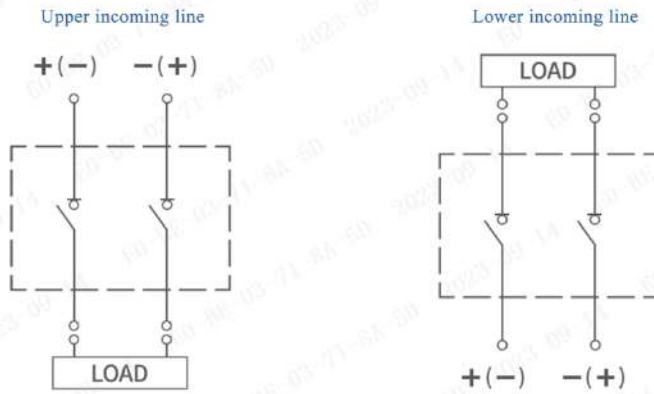
	<p>The opening and closing buttons on the mask can be locked to prevent misoperation.</p> <p>(Note: The padlock shall be provided by the customer)</p>
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3.8 Door frame

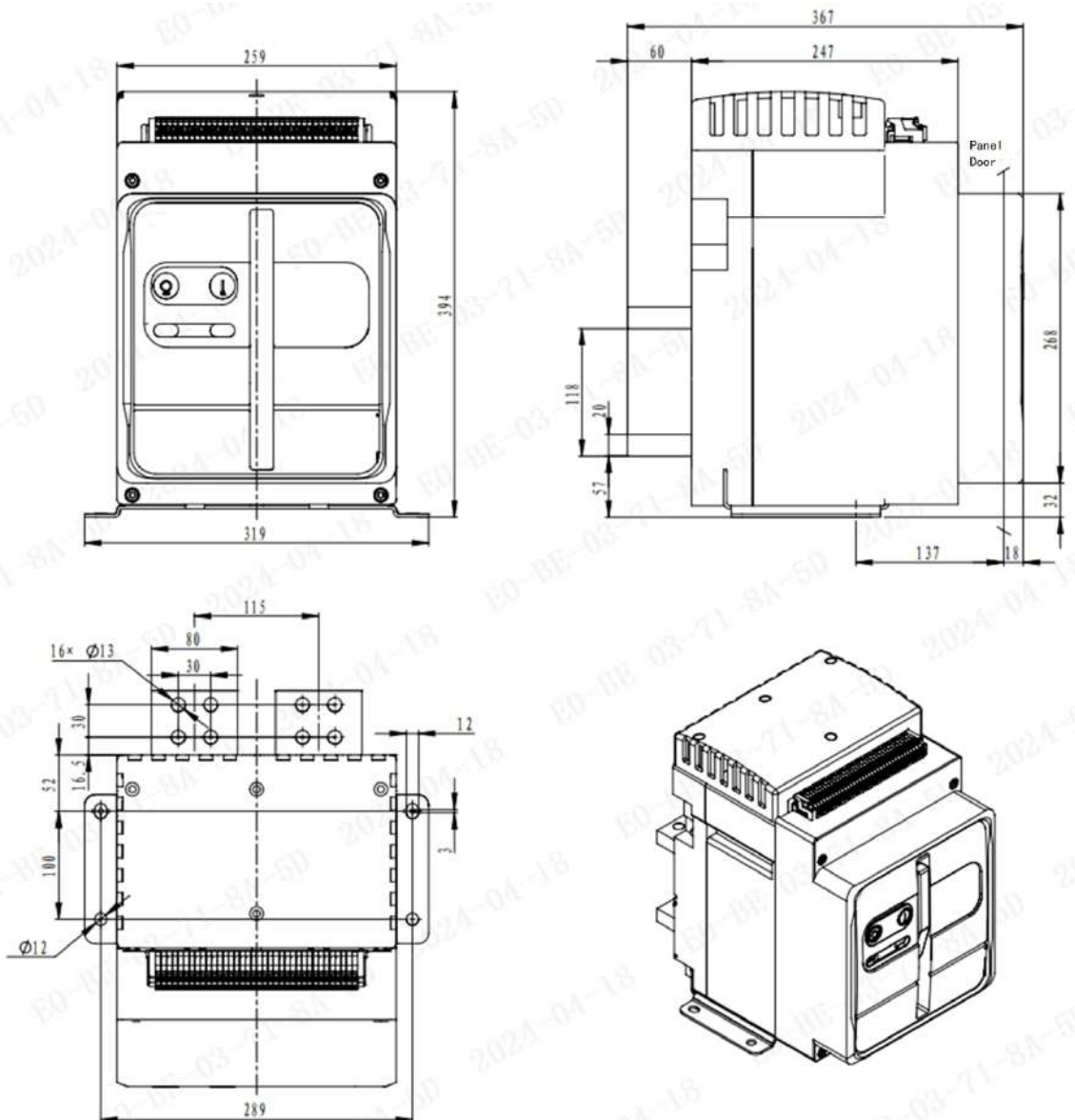
	<p>It is installed on the door of the cabinet chamber for sealing, making the protection level of the disconnecting switch reach IP40.</p>
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Chapter IV Wiring Mode, Outline, and Installation Dimensions

4.1 Wiring mode



4.2 Outline and installation dimensions (unit: mm)

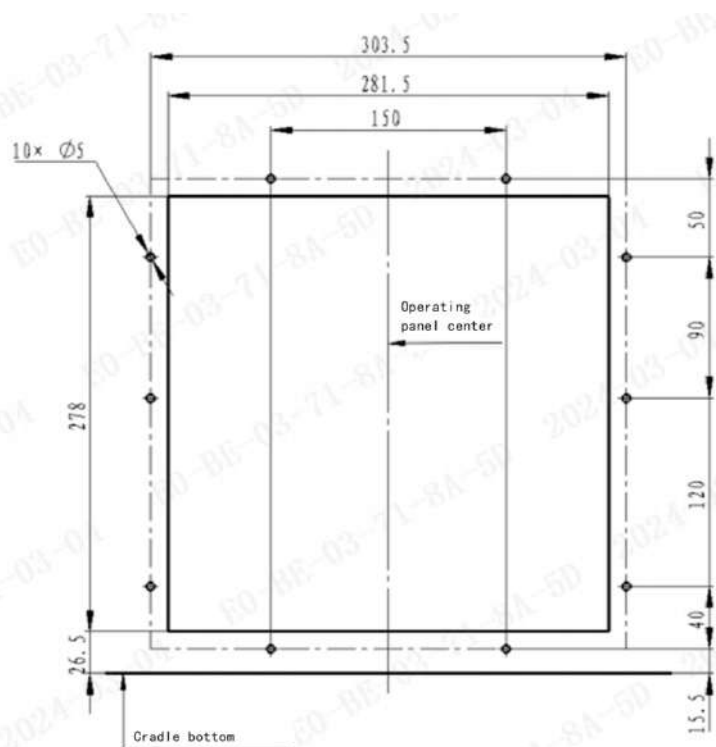


Note: The busbar is connected by M12 bolts of Grade 8.8 and contact gaskets at tightening torque of 60 N·m.

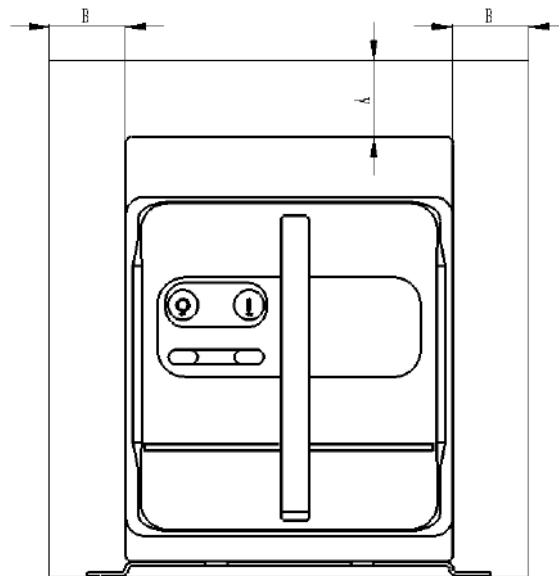
4.3 Reference Specifications of Switch-disconnector's Main Circuit Copper Bar

Rated current of frame	Rated current (A)	Copper bar specification (40°C)		Copper bar specification (50°C)	
		Qty.	Dimensions (mm)	Qty.	Dimensions (mm)
HCG4-4000	1600	2	100mm×5mm	3	100mm×5mm
		2	76.2mm×6.4mm (英寸: 3×1/4)	3	76.2mm×6.4mm (英寸: 3×1/4)
	2000	3	90mm×5mm	4	90mm×5mm
		2	102mm×6.4mm (英寸: 4×1/4)	3	102mm×6.4mm (英寸: 4×1/4)
	2500	4	80mm×5mm	3	80mm×10mm
		2	127mm×6.4mm (英寸: 5×1/4)	3	127mm×6.4mm (英寸: 5×1/4)
	3000	3	90mm×10mm	4	80mm×10mm
		4	102mm×6.4mm (英寸: 4×1/4)	5	102mm×6.4mm (英寸: 4×1/4)
	3200	3	90mm×10mm	4	80mm×10mm
		4	102mm×6.4mm (英寸: 4×1/4)	5	102mm×6.4mm (英寸: 4×1/4)
	4000	4	80mm×10mm	4	100mm×10mm
		4	127mm×6.4mm (英寸: 5×1/4)	5	127mm×6.4mm (英寸: 5×1/4)

4.4 Panel front door Mounting hole(unit: mm)



4.5 Safe Distance (unit: mm)

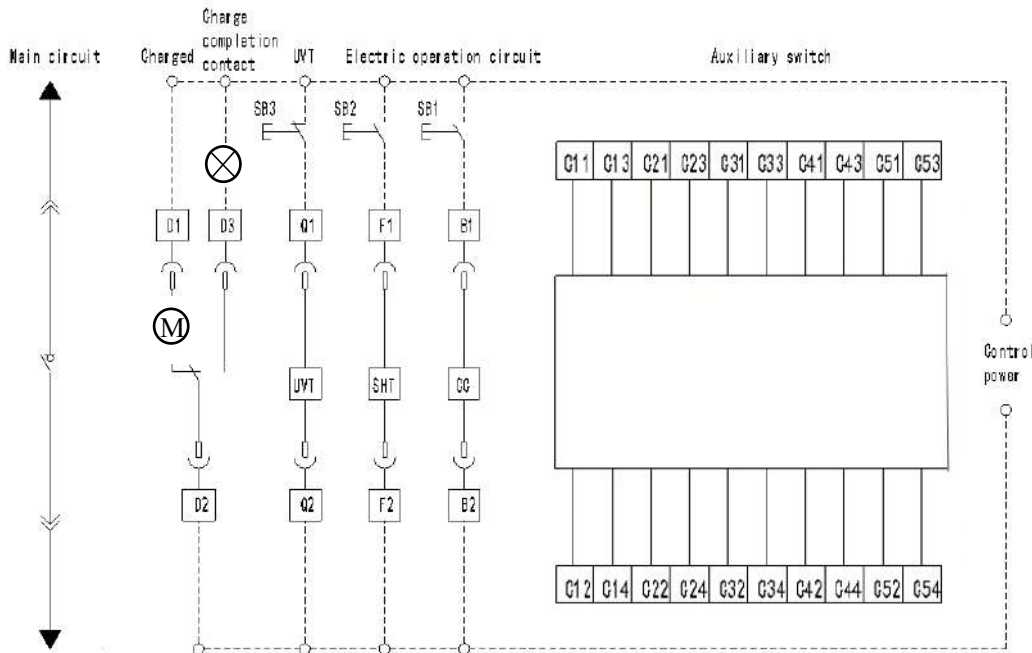


	To the insulator (\geq)	To the metallic body (\geq)
A	0	60
B	0	60

4.6 Power loss (unit: W)

Rated current of frame	Power consumption (Single Pole)
HCG4-4000	≤ 150

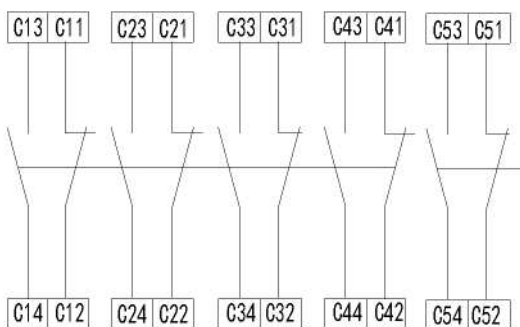
Chapter V Circuit diagram (DC Switch-disconnectors)



SB1 — closing button (provided by the customer); SB2 — shunt button (provided by the customer); SB3 — undervoltage disconnection button (provided by the customer)

Note: The current state of the Switch-disconnectors is de-energized, open, and without energy storage;

Five Open and Five Closed



Four Open and Four Closed

