















# High Voltage DC Contactor Quick Selection Guide



**March 2024**

Model		CHEV-S60/120	CHEV-P100	CHEV-P150B	CHEV-P150D	CHEV-P250	
Photo							
Compliance		TUV	/	/	/	/	
Contact data	Main contact form	SPST-NO-DM (polarized load)	SPST-NO-DM (polarized load)	SPST-NO-DM (polarized load)	SPST-NO-DM (polarized load)	SPST-NO-DM (polarized load)	
	Auxiliary contact form	/	/	/	/	/	
	Rated voltage	900VDC	450VDC/750VDC	450VDC/750VDC	450VDC/750VDC	450VDC/750VDC	
	Rated current	60A/120A	100A	150A	150A	250A	
	Contact resistance	≤1.6/≤0.8mΩ	≤0.5 mΩ	≤0.5 mΩ	≤0.5 mΩ	≤0.2 mΩ	
	Current withstand	90A: 2h/150A: 2h	150A: 2h	220A: 10min	225A: 10min	375A: 10min	
		600A: 0.6s/900A: 6s	1000A: 1s	1000A: 8s	900A: 8s	2500A: 0.6s	
	Maximum breaking current	600A/1200A (450VDC) 1 time	1000A (300VDC) 1 time	1200A (450VDC) 1 time	1200A (450VDC) 1 time	2000A (450VDC) 1 time	
	Maximum switching power	54kW/108kW (900VDC)	75kW (750VDC)	112.5kW (750VDC)	112.5kW (750VDC)	187.5kW (750VDC)	
	Maximum switching voltage	900VDC	750VDC	750VDC	750VDC	1000VDC	
	Dielectric strength	Between contacts and coil	3000VAC 1min	4000VAC 1min	4000VAC 1min	4000VAC 1min	4000VAC 1min
		Between contacts	3000VAC 1min	3000VAC 1min	3000VAC 1min	3000VAC 1min	3000VAC 1min
	Insulation resistance	Between contacts and coil	>1000 MΩ (at 1000 VDC)	>1000 MΩ (at 1000 VDC)	>1000 MΩ (at 1000 VDC)	>1000 MΩ (at 1000 VDC)	>1000 MΩ (at 1000 VDC)
		Between contacts					
	Operation time	≤25ms	≤30ms	≤30ms	≤30ms	≤50ms	
Release time	≤15ms	≤10ms	≤10ms	≤10ms	≤30ms		
Coil data	Nominal voltage	12VDC   24VDC	12VDC   24VDC	12VDC   24VDC	12VDC   24VDC	12VDC   24VDC	
	Operate voltage	≤9VDC   ≤18VDC	≤9VDC   ≤18VDC	≤9VDC   ≤18VDC	≤9VDC   ≤18VDC	≤9VDC   ≤18VDC	
	Release voltage	≥0.6VDC   ≥1.2VDC	≥1VDC   ≥2VDC	≥1VDC   ≥2VDC	≥1VDC   ≥2VDC	≥1VDC   ≥2VDC	
	Rated power	6W	5.5W	5.5W	5.5W	6W	
Expected life	Mechanical life	2×10 <sup>5</sup> times	2×10 <sup>5</sup> times	2×10 <sup>5</sup> times	2×10 <sup>5</sup> times	2×10 <sup>5</sup> times	
	Electrical life (resistive load)	6000 times (rated current 450VDC) 1000 times (rated current 750VDC)	3000 times (rated current 450VDC) 1000 times (rated current 750VDC)	2000 times (rated current 450VDC) 500 times (rated current 750VDC)	2000 times (rated current 450VDC) 500 times (rated current 750VDC)	1000 times (rated current 450VDC) 500 times (rated current 750VDC)	
Shock	Destructive	392m/s <sup>2</sup>	490 m/s <sup>2</sup>	490 m/s <sup>2</sup>	490 m/s <sup>2</sup>	490 m/s <sup>2</sup>	
	Functional	close: 98 m/s <sup>2</sup> open: 196m/s <sup>2</sup>	close: 98 m/s <sup>2</sup> open: 196m/s <sup>2</sup>	close: 98 m/s <sup>2</sup> open: 196m/s <sup>2</sup>	close: 98 m/s <sup>2</sup> open: 196m/s <sup>2</sup>	close: 98 m/s <sup>2</sup> open: 196m/s <sup>2</sup>	
Vibration		10HZ~2000HZ, 20G	10HZ~500HZ, 49m/s <sup>2</sup>	10HZ~500HZ, 49m/s <sup>2</sup>	10HZ~500HZ, 49m/s <sup>2</sup>	10HZ~500HZ, 49m/s <sup>2</sup>	
Environment	Operating temperature	-40°C~85°C	-40°C~85°C	-40°C~85°C	-40°C~85°C	-40°C~85°C	
	Humidity	5%RH~85RH	5%RH~85RH	5%RH~85RH	5%RH~85RH	5%RH~85RH	
Mounting	Load terminal	M5 screw	M4 screw	M6x12 screw	M4 screw	M6x12 screw	
	Base	M4 screw	M5 screw	M5 screw	M5 screw	M5 screw	
Weight		~210g	~280g	~300g	~280g	~570g	

Model		CHEV-NA60/120		CHEV-H250		CHPV-S400B		CHEV-P500		CHPV-S600		
Photo												
Compliance		UL/TUV/CCC		UL/TUV/CCC		UL/TUV/CCC		UL/TUV		UL/TUV/CCC		
Contact data	Main contact form	SPST-NO-DM Bi-directional load		SPST-NO-DM Bi-directional load		SPST-NO-DM Bi-directional load		SPST-NO-DM Bi-directional load		SPST-NO-DM Bi-directional load		
	Auxiliary contact form	SPST-NO-DM Bi-directional load		SPST-NO-DM Bi-directional load		SPST-NO-DM Bi-directional load		N/A		SPST-NO-DM Bi-directional load		
	Rated voltage	1000VDC		1000VDC		1000VDC		1000VDC		1000VDC		
	Rated current	60A/120A		250A		400A		500A		600A		
	Contact resistance	≤1.67mΩ		≤0.3 mΩ		≤0.3 mΩ		≤0.3 mΩ		≤0.3 mΩ		
	Current withstand	150A: 2h		350A: 8min		500A: 2000s		700A: 1min		700A: 2000s		
		900A: 6s		8000A: 5ms		8000A: 5ms		8000A: 5ms		8000A: 5ms		
	Maximum breaking current	600A/1200A (450VDC) 1 time		2000A (1000VDC) 1 time		2000A (1000VDC) 1 time		2000A (450VDC) 1 time		2000A (1000VDC) 1 time		
	Maximum switching power	60kW/120KW (1000VDC)		250kW (1000VDC)		400kW (1000VDC)		500kW (1000VDC)		600kW (1000VDC)		
	Maximum switching voltage	1000VDC		1000VDC		1000VDC		1000VDC		1000VDC		
	Dielectric strength	Between contacts and coil	3000VAC 1min		4000VAC 1min		4000 VAC 1min		4000VAC 1min		4000 VAC 1min	
		Between contacts	3000VAC 1min		4000VAC 1min		4000 VAC 1min		4000VAC 1min		4000 VAC 1min	
	Insulation resistance	Between contacts and coil	>1000 MΩ (at 1000 VDC)		>1000 MΩ (at 1000 VDC)		>1000 MΩ (at 1000 VDC)		>1000 MΩ (at 1000 VDC)		>1000 MΩ (at 1000 VDC)	
Between contacts		>1000 MΩ (at 1000 VDC)		>1000 MΩ (at 1000 VDC)		>1000 MΩ (at 1000 VDC)		>1000 MΩ (at 1000 VDC)		>1000 MΩ (at 1000 VDC)		
Operate time	≤25ms		≤30ms		<50ms		≤35ms		<50ms			
Release time	≤15ms		≤10ms		<15ms		≤15ms		<30ms			
Coil data	Rated voltage	12VDC	24VDC	12VDC	24VDC	12VDC	24VDC	12VDC	24VDC	12VDC	24VDC	
	Operate voltage	≤9VDC	≤18VDC	≤9VDC	≤18VDC	≤9VDC	≤18VDC	≤9VDC	≤18VDC	≤9VDC	≤18VDC	
	Release voltage	≥1.2VDC	≥2.4VDC	≥1VDC	≥2VDC	≥1.2VDC	≥2.4VDC	≥1VDC	≥2VDC	≥1.2VDC	≥2.4VDC	
	Rated power	NA60 : 3.6W NA120 : 6W		6W		Closing: 50W Holding: 8W		6W		Closing: 50W Holding: 8W		
Expected life	Mechanical life	2×10 <sup>5</sup> times		5×10 <sup>5</sup> times		5×10 <sup>5</sup> times		1×10 <sup>6</sup> times		5×10 <sup>5</sup> times		
	Electrical life (resistive load)	Switching: 6000 times (1000VDC, 20A/40A) Switching: 50 times (1000VDC, 60/120A)		Switching: 1000 times (1000VDC, 250A)		Breaking: 1000 times (1000VDC, 400A) Breaking: 30000 times (50VDC, 400A)		Switching: 6000 times (1000VDC, 200A) Switching: 100 times (1000VDC, 500A) Breaking: 1000 times (1000VDC, 500A)		Breaking: 1000 times (1000VDC, 600A) Breaking: 30000 times (50VDC, 600A)		
Shock	Destructive	392m/s <sup>2</sup>		490m/s <sup>2</sup>		490m/s <sup>2</sup>		490m/s <sup>2</sup>		490m/s <sup>2</sup>		
	Functional	close: 98 m/s <sup>2</sup> open: 196m/s <sup>2</sup>		close: 98 m/s <sup>2</sup> open: 196m/s <sup>2</sup>		close: 98 m/s <sup>2</sup> open: 196m/s <sup>2</sup>		close: 98 m/s <sup>2</sup> open: 196m/s <sup>2</sup>		close: 98 m/s <sup>2</sup> open: 196m/s <sup>2</sup>		
Vibration		10Hz~2000Hz, 20G		10HZ~500HZ,49m/s <sup>2</sup>		10~500Hz, 49m/s <sup>2</sup>		10~500Hz, 49m/s <sup>2</sup>		10~500Hz, 49m/s <sup>2</sup>		
Environment	Temperature	-40°C~85°C		-40°C~85°C		-40°C~85°C		-40°C~85°C		-40°C~85°C		
	Humidity	20%RH~85%RH		5%RH~95%RH		5%RH~95%RH		5%RH~95RH		5%RH~95%RH		
Mounting	Load terminal	M5x10 Combination screw		M6x12 Combination screw		M8 Combination screw		M8 Combination screw		M10 Combination screw		
	Base	M4 screw		M5 screw		M5 screw		M6 screw		M6 screw		
Weight		~211g		~450g		~810g		~600g		~900g		

Model		CHPV-S20		CHPV-S40		CHPV-S250		CHPV-S350		CHPV-S400		
Photo												
Compliance		UL/TUV/CCC		UL/TUV/CCC		UL/TUV/CCC		UL/TUV/CCC		UL/TUV/CCC in progress		
Contact data	Main contact form	SPST-NO-DM Bi-directional load		SPST-NO-DM Bi-directional load		SPST-NO-DM Bi-directional load		SPST-NO-DM Bi-directional load		SPST-NO-DM Bi-directional load		
	Auxiliary contact form	N/A		N/A		SPST-NO Bi-directional load		SPST-NO Bi-directional load		SPST-NO Bi-directional load		
	Rated voltage	1000VDC/1500VDC		1000VDC/1500VDC		1500VDC		1500VDC		1500VDC		
	Rated current	20A		40A		250A		350A		400A		
	Contact resistance	≤4.5mΩ		≤3mΩ		0.3mΩ		0.3mΩ		0.3mΩ		
	Current withstand	30A, 1h		60A, 1h		450A / 20min		400A / 10min		500A / 2000s		
		200A, 0.6s		400A, 0.6s		1000A / 1.8min		2000A / 1s		2000A / 1s		
	Maximum breaking current	200A (1000VDC) 1 time		400A (450VDC) 1 time		2000A (1000VDC)		2000A (1000VDC)		2000A (1000VDC)		
	Maximum switching power	30KW (1500VDC)		40KW (1000VDC) 60KW (1500VDC)		375kW (1500VDC)		525kW (1500VDC)		525kW (1500VDC)		
	Maximum switching voltage	1500VDC		1500VDC		1500VDC		1500VDC		1500VDC		
	Dielectric strength	Between contacts and coil	3000VAC 1min		3000VAC 1min		4000 VAC 1min		4000 VAC 1min		4000 VAC 1min	
		Between contacts	4000VAC 1min		4000VAC 1min		4000 VAC 1min		4000 VAC 1min		4000 VAC 1min	
	Insulation resistance	Between contacts and coil	> 1000 MΩ (at 1000 VDC)		> 1000 MΩ (at 1000 VDC)		> 1000 MΩ (at 1000 VDC)		> 1000 MΩ (at 1000 VDC)		> 1000 MΩ (at 1000 VDC)	
		Between contacts										
Operate time	≤15ms		≤15ms		≤50ms		≤50ms		≤50ms			
Release time	≤5ms		≤5ms		≤15ms		≤15ms		≤15ms			
Coil data	Rated voltage	12VDC	24VDC	12VDC	24VDC	12VDC	24VDC	12VDC	24VDC	12VDC	24VDC	
	Operate voltage	≤9VDC	≤18VDC	≤9VDC	≤18VDC	≤9VDC	≤18VDC	≤9VDC	≤18VDC	≤9VDC	≤18VDC	
	Release voltage	≥1VDC	≥2VDC	≥1VDC	≥2VDC	≥1.2VDC	≥2.4VDC	≥1.2VDC	≥2.4VDC	≥1.2VDC	≥2.4VDC	
	Rated power	2.6W		2.6W		Closing: 55W Holding: 6W		Closing: 55W Holding: 6W		Closing: 55W Holding: 6W		
Expected life	Mechanical life	2× 10 <sup>5</sup> times		2× 10 <sup>5</sup> times		2× 10 <sup>5</sup> times		2× 10 <sup>5</sup> times		2× 10 <sup>5</sup> times		
	Electrical life	Switching: 7.5×10 <sup>4</sup> (450VDC, 20A) Switching: 6000 times (1500VDC, 20A)		Switching: 7.5×10 <sup>4</sup> (450VDC, 20A) Switching: 6000 times (1500VDC, 20A)		Switching: 30 times (1500VDC, 250A) breaking: 800 times (1500VDC, 250A)		Breaking: 10 times (1500VDC, 300A) Breaking: 1000 times (1000VDC, 350A)		Breaking: 10 times (1500VDC, 300A) Breaking: 1000 times (1000VDC, 400A)		
Shock	Destructive	490m/s <sup>2</sup>		490m/s <sup>2</sup>		490m/s <sup>2</sup>		490m/s <sup>2</sup>		490m/s <sup>2</sup>		
	Functional	Close: 98m/s <sup>2</sup> Open: 196m/s <sup>2</sup>		Close: 98m/s <sup>2</sup> Open: 196m/s <sup>2</sup>		Close: 98m/s <sup>2</sup> Open: 196m/s <sup>2</sup>		Close: 98m/s <sup>2</sup> Open: 196m/s <sup>2</sup>		Close: 98m/s <sup>2</sup> Open: 196m/s <sup>2</sup>		
Vibration		10HZ~500HZ, 49m/s <sup>2</sup>		10HZ~500HZ, 49m/s <sup>2</sup>		10~500Hz, 49m/s <sup>2</sup>		10~500Hz, 49m/s <sup>2</sup>		10~500Hz, 49m/s <sup>2</sup>		
Environment	Temperature	-40°C~85°C		-40°C~85°C		-40°C~85°C		-40°C~85°C		-40°C~85°C		
	Humidity	5%RH~85%RH		5%RH~85%RH		5%RH~95%RH		5%RH~95%RH		5%RH~95%RH		
Mounting	Load terminal	QC terminal		M4 screw		M8 Combination screw		M6x18 Combination screw		M6x18 Combination screw		
	Base	M5 screw		M4 screw		M5 screw		M6 screw		M6 screw		
Weight		~139g		~125g		~810g		~900g		~900g		

# Precautions for the use of high-voltage DC relays

## 1. The environment during use, storage and transportation

1.1 When using, storing and transporting, please avoid direct sunlight, and maintain normal temperature, humidity and pressure, and the recommended storage environment is:

A) Temperature: 0°C~40°C B) Humidity: 5%~85%RH

1.2 In a high humidity environment, when the ambient temperature changes sharply, condensation may occur inside the relay, resulting in the deterioration of the relay insulation, coil disconnection, rust and other phenomena. So please pay attention. A typical example of this environment is on a ship that carries out sea transport.

1.3 Low temperature environment below 0°C . Please be careful that plastic may become brittle through prolonged storage in a low temperature and low humidity environment. In a low temperature environment below 0°C, be aware of icing. For non-hermetic products, icing can cause malfunctions such as delayed operation or obstruction of movement.

1.4 The contact of CHEV, CHPV series products is in the sealed cavity, the cavity is filled with gas, the leakage rate of the gas and the temperature of the cavity (ambient temperature and the temperature rise generated by the power of the contact) is proportional to the relationship, please ensure that the ambient temperature is within -40 °C ~ +85 °C.

1.5 Avoid using relays near strong magnetic fields (around transformers, magnets) and near heat-generating objects.

1.6 For single-coil products, in order to suppress the reverse electromotive force of the relay coil, it is recommended to install a nonlinear resistor (variable resistor is recommended. Maximum energy tolerance: 1J or more; Voltage: 1.5~2 times of rated voltage). Please note that the use of diodes will greatly increase the release time of the relay, which will definitely lead to a decrease in the cut-off performance.

## 2. Safety precautions

Please note that when the relay is working normally, there is a risk of electric shock if touched by hand. Please note that when installing, maintaining and troubleshooting relays (including connection parts such as end stations and sockets), please cut off the power supply first. Please note that when connecting the load lead-out, you should refer to the wiring diagram on the product manual before connecting it correctly. If the connection is wrong, it may cause unforeseen mis-operation, abnormal heating, fire, etc.

## 3. Application precautions

3.1 Products with polarity must be used correctly in accordance with the label on the surface of the product. When the load connection is polarized in reverse, the promised electrical characteristics cannot be guaranteed. The polarity of each series of products is described in Table 1.

Table 1

Model	Load	Coil	Auxiliary contacts (Y/N)	Model	Load	Coil	Auxiliary contacts (Y/N)
CHEV-S60/120	★	☆	selectable	CHPV-S20	☆	☆	N
CHEV-NA60/120	☆	☆	selectable	CHPV-S40	☆	☆	N
CHEV-P100	★	☆	N	CHPV-S250	☆	★	Y
CHEV-P150D	★	☆	N	CHPV-S350	☆	★	Y
CHEV-P200	★	☆	N	CHPV-S400	☆	★	Y
CHEV-P250	★	☆	N	CHPV-S400B	☆	★	Y
CHEV-H250	☆	☆	selectable	CHPV-S600	☆	★	Y
CHEV-P500	☆	☆	N				

★: Indicates that there is polarity, and the connection must be connected according to the polarity identification

☆: Indicates non-polarized

## Precautions for the use of high-voltage DC relays

3.4 DC relay is a high-voltage DC switching device, which may fail when the number of life and load capacity specified in the manual are exceeded, and a protection circuit that can cut off the load in an emergency should be adopted. As a product with limited life, relays should be replaced in time to ensure safety.

3.5 When installing, ensure that the main power cord is close to the lead end of the relay, and then tighten in the order of flat washer, spring washer, nut, or use the self-locking nut directly. Incorrect connection sequence can cause severe overheating and cause the insulation of the connecting cable to melt.

3.6 The screw locking torque of each part of the relay should be controlled within the range specified in Table 2. Loose screws may cause abnormal heat when energized and cause fire, and may cause damage to the sealed cavity and thread damage when it exceeds the range.

Table 2

Screw	Torque
M4	1.8N·m~2.7N·m
M5	3N·m~4N·m
M6	6N·m~8N·m
M8	9N·m~11N·m
M10	13.5N·m~16.5N·m

3.7 Please avoid adhering foreign objects such as grease on the outlet end of the relay, and use the connecting wires corresponding to the specifications in Table 3, otherwise it may cause abnormal heating at the load end.

Table 3

Current	Wire	Current	Wire
10A	More than 1.5mm <sup>2</sup>	150A	More than 50mm <sup>2</sup>
20A	More than 2.5mm <sup>2</sup>	200A	More than 95mm <sup>2</sup>
40A	More than 10mm <sup>2</sup>	250A	More than 120mm <sup>2</sup>
60A	More than 16mm <sup>2</sup>	300A	More than 185mm <sup>2</sup>
80A	More than 25mm <sup>2</sup>	400A	More than 240mm <sup>2</sup>
100A	More than 35mm <sup>2</sup>	600A	More than 2x185mm <sup>2</sup>

### 4. Other precautions

4.1 The operation and use above the specification should be avoided, including but not limited to the over-specification use of coil rating, main contact rating and electrical life. In order to avoid abnormal heating phenomena, smoke, fire and other accidents.

4.2 The above only lists the common precautions of current common DC relay products, if you have any questions, please contact the company for more technical support.

4.3 For the description of these precautions and various models of product parameters, there is no prior notice; When Churod and the customer have detailed specifications (such as technical specifications) recognized by both parties, the instructions and requirements related to the product should be implemented according to the detailed specifications.