HONGFA

Hongfa committed to E-mobility

HVDC RELAYS

GREEN SOLUTIONS

COMPANY PROFILE

Hongfa (stock code: SH600885) is the largest relay research and production center and export base in China, with an annual production capability of 2.0 billion pieces. Hongfa's enterprising spirit is based on the motto "Persevere for Progress, Strive for Excellence." and the operational philosophy of "Focusing on the market; Winning through quality." These beliefs have led Hongfa to its position world-class base for relay research and production, with 30 subsidiaries worldwide.

Hongfa's core products are electromechanical relays. Over the year, Hongfa has expanded its product portfolio to include low-voltage and high-voltage devices, high-precision components, and automation equipment. Hongfa exports relays to more than 120 countries and has local sales, customer service, and application engineering outposts across the globe. Hongfa serves customers in a wide range of markets, including industry, energy, transportation, communication, household appliances, medical technology, and defense.

Hongfa "Strives for Excellence" by embracing technology, focusing on product development while adopting the latest advances in the field. Hongfa has a national level R&D center with the largest testing laboratory in the industry. Hongfa developed the first post-doctoral research program in China. Hongfa engineers and scientists are constantly pushing the relay industry forward and influencing changes to many professional and national standards.

Hongfa recognizes that our Earth has limited resources, and highlights all efforts toward from environmental protection, science, technology, and the green industry. Hongfa understands and supports the worldwide trend of support for alternative energy vehicles, PV, and wind power, and assembled a professional research team at a very early stage in the process. Hongfa is the first HVDC relay manufacturer in China to independently develop the ability to manufacture in volume, producing HVDC relays to meet the growing demands of the PV industry, alternative energy vehicle manufacturers, charging station developers, and more.

Hongfa's Technology Strengths:

- Largest relay research and production center China.
- World class mold design, plastic producing and precision metal fabrication capabilities.
- Quality design and manufacturing of automation assembly equipment.
- Largest test laboratory with latest test equipment in the relay industry.
- Complete quality-control system.

HVDC RELAYS

- Mechanically tested to ISO 16750 standards.
- Safety guaranteed, insulation compliant with IEC 60664-1 & ISO 6469-3 standards.

HV vacuum-sealing machine

Laser-welding machine

PHEV & BEV Solutions

HFE82V (Small size, high capability for short circuit current, ceramic chamber structure)

- High short circuit current, up to 12kA
- Small size to save mounting space
- Ceramic chamber structure, no arc leakage, waterproof contacts, dust-proof and oxidation-resistant
- High reliability and long service life
- Broad range in load, current switching between 60-1000A, working voltage between 12-1000Vdc
- Strong structure for arc blow-out

Pre-charge Solutions

HFE80V-20C (Plastic-package Structure Series With High Price-Performance Ratio)

- Ideal for micro EV and low voltage applications
- Strong structure for arc blow-out
- Large contact gap
- Broad range in load, current switching between 20-200A, working voltage up to 12-450V
- Working voltage for 20A,40A is 450Vdc,60A-200A is 200Vdc

48Vdc Battery Systems

HFE80V-100B (Plastic-package Structure Series With High Price-Performance Ratio)

- Preferred products for 48V system
- Low height and small size
- Low power consumption and low noise

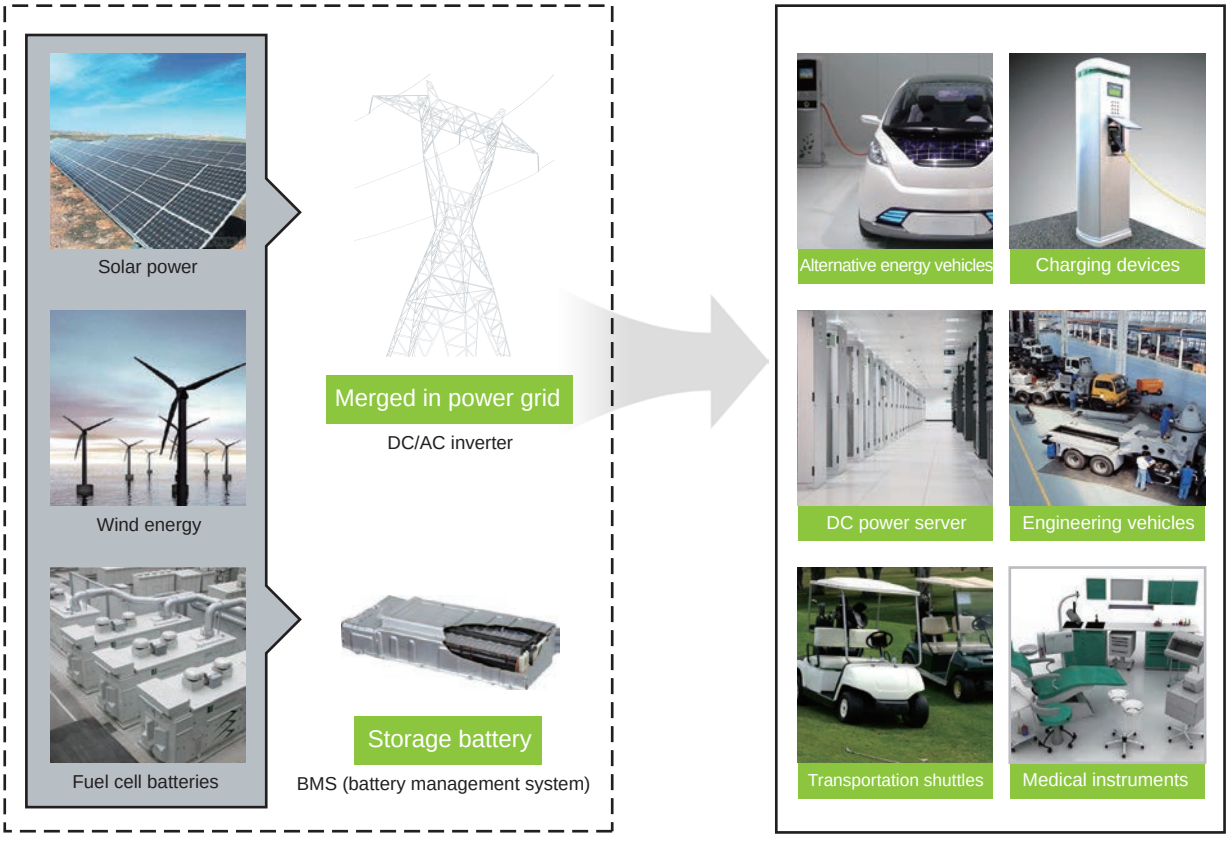
Energy Storage Solutions

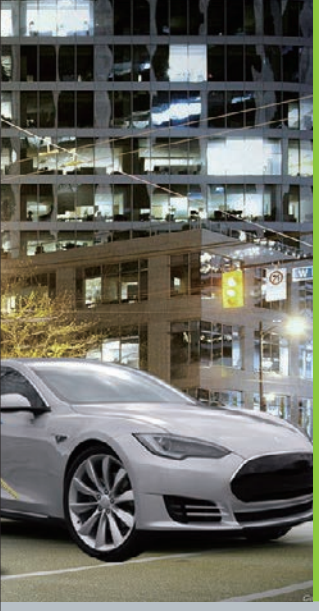
HFE82P, HFE85P, HFE88P

- Ceramic chamber structure, no arc leakage, waterproof contacts, dust-proof and oxidation-resistant
- Circular structure with small size
- High reliability and long service life
- Current switching between 20-350A, working voltage between 12-1500Vdc
- The full sealed structure enables the relay workable in hostile environment
- With Auxiliary contact

APPLICATIONS

Hongfa's HVDC-relays can be used to switch DC power for a wide range of applications - alternative energy vehicles (E-Mobility), transportation shuttles, power-charging devices, PV- and wind-power systems, construction and industry vehicles, DC-server-power and UPS, medical instruments, and more.



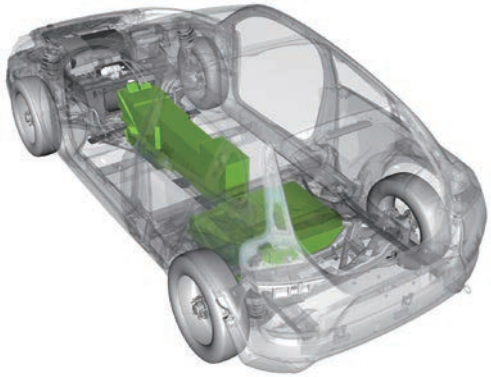


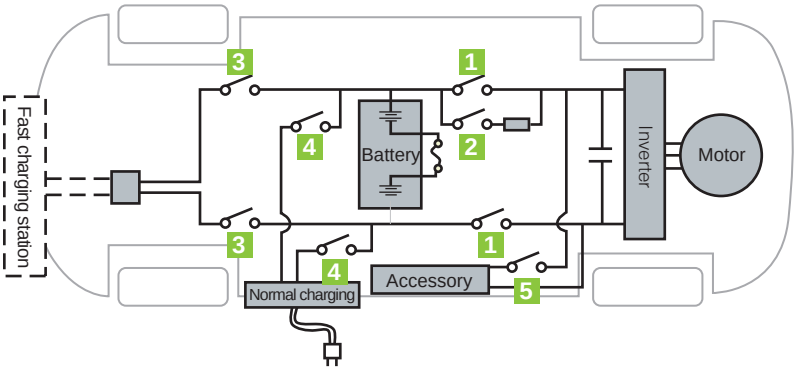
Electric & Hybrid Vehicles

HVDC relays are one of the key components in the manufacturing of alternative energy vehicles. The category of "alternative energy vehicles" includes not only EVs , but HEVs, PHEV/PEVs, and fuel cell vehicles as well.

HVDC relays are used in various functions of alternative energy vehicles as follows:

- Main relays (circuit protection / safety control):
  Often rated for large currents (from 80A to 600A), mainly used to disconnect the battery.
- Fast charge relays:
  This type of relays are Used to control the fast charging process.
  Rated - the rated currents are from 32A to 600A.
- Auxiliary applications relays:
  Relays for these applications are mainly Used for air conditioners, heating systems, DC/AC-converters, etc. The typical rating is between 20A and 40A.
- HV Pre-charge relays:
  Used in pre-charge circuits.





1 Main relays:
HFE82V-100D, HFE82V-150D, HFE82V-200B, HFE82V-250C, HFE82V-300C, HFE82V-400M, HFE82V-600, HFE85V-150, HFE85V-250, HFE85V-350

2 Pre-charge relays:
HFE80V-20C

3 Fast charge relays:
HFE82V-100D, HFE82V-150D, HFE82V-200B, HFE82V-250C, HFE82V-300C, HFE82V-400M, HFE82V-600

4 Normal charge relays:
HFE80V-20C, HFE82V-10, HFE82V-20, HFE82V-40, HFE82V-60B

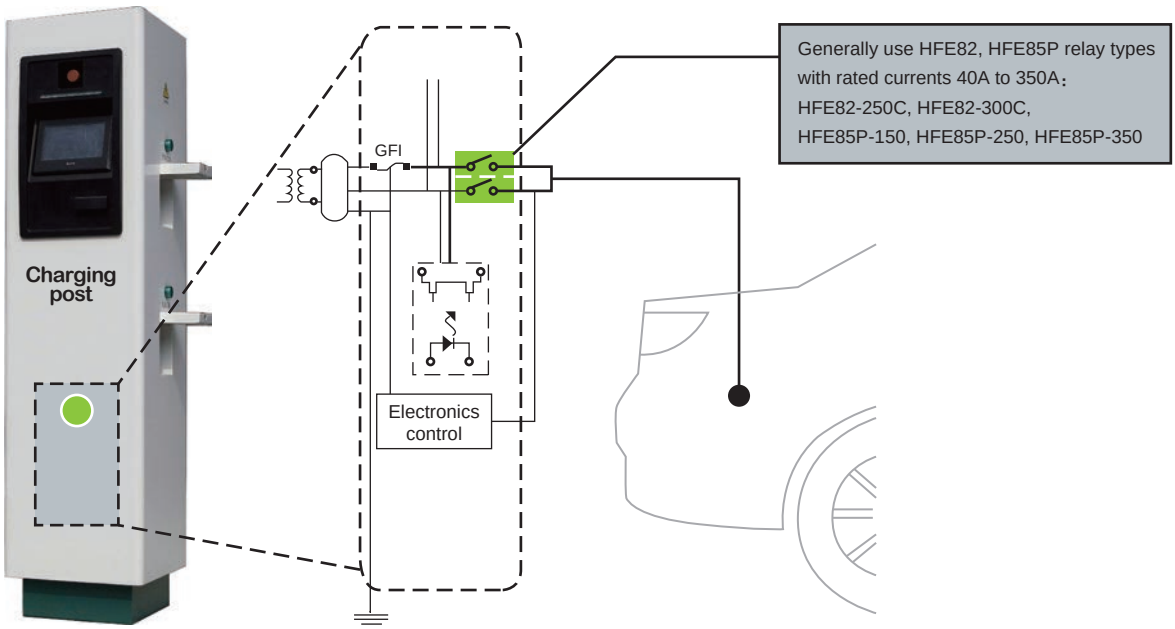
5 HV auxiliary relays:
HFE80V-20C, HFE82V-10, HFE82V-20, HFE82V-40, HFE82V-60B

Power Charging Devices

Alternative energy vehicles use a system of charging stations, wall boxes, and charging posts to power up.

- Charging stations can charge a multiple alternative energy vehicles at the same time. These types of stations are mainly used for public alternative energy vehicles and person shuttle buses.
- Charging posts are typically located in residential or business areas and are mainly used for private vehicle charging.

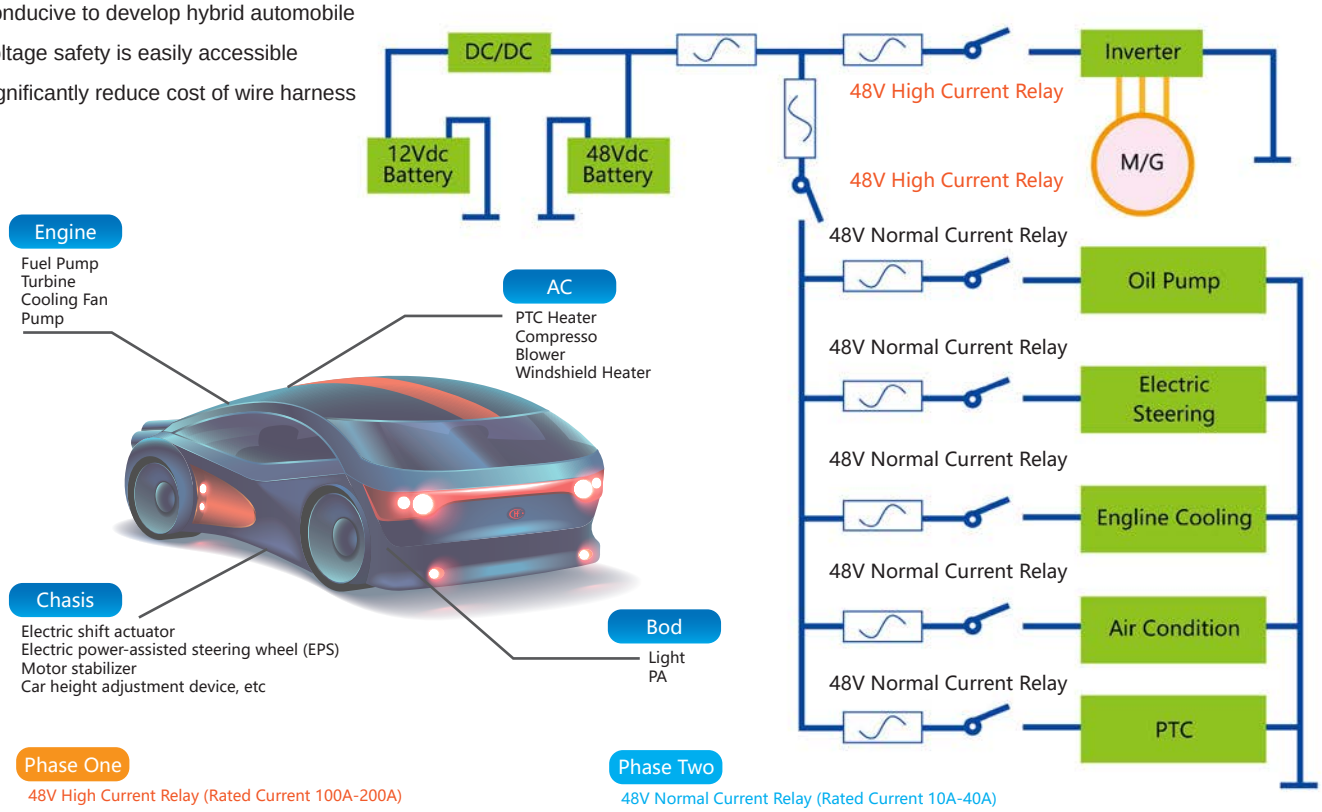
HVDC relays function within charging devices is by switching DC power. These devices generally use HFE82, HFE85P relay types with rated currents from 40A to 350A.



48Vdc Battery Systems

48V Start-stop System has good performance in reducing oil consumption and high price-performance ratio, which can increase the energy efficiency about 5% to 10%. It is a big trend of automotive industry. DV relays of Hongfa can provide safe and reliable analysis for 48V system, and can achieve controlling of oil pump, power steering, air conditioning and PTC heater.

- Much high-tech has been widely used
- Significantly improve efficiency of motor
- Conducive to develop hybrid automobile
- Voltage safety is easily accessible
- Significantly reduce cost of wire harness



Phase One

48V High Current Relay (Rated Current 100A-200A)

Screw or Brazing Type

HFV19-100 HFV29-200

Phase Two

48V Normal Current Relay (Rated Current 10A-40A)

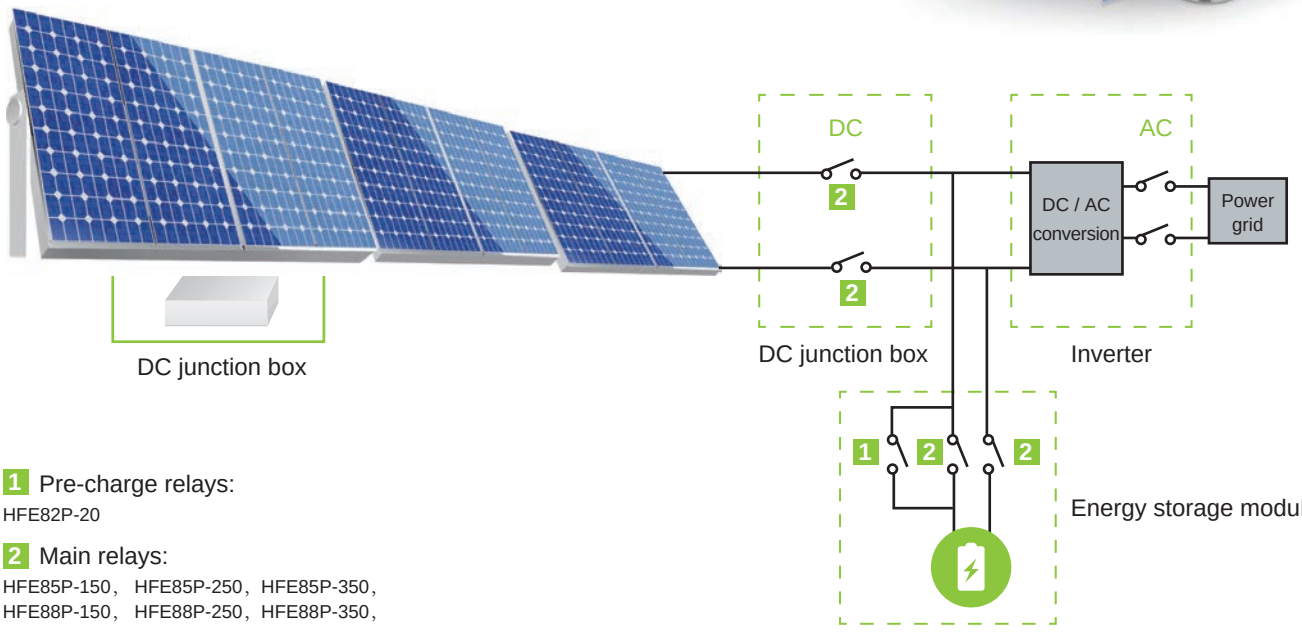
Plug-In Type PCB Type

HFV15-SH(753) HFV30-20 HFKM(753) HFK10(753)

PV& Energy Storage Solutions

The energy storage industry is a forward-looking technology to promote the development of new energy industry. It has developed into various technical types such as physical energy storage, electrochemical energy storage, heat storage and hydrogen storage.

HVDC relays can be used in energy storage for different applications such as new energy grid-connected, electric vehicles, smart grids, microgrids, distributed energy systems, home energy storage systems, and power supply projects in areas without electricity etc. It can solve the intermittent and unstable problems brought by the grid connection of energy storage and power generation, ensure the reliability of the power supply of the microgrid system, and realize the dynamic adjustment of high power and reduce the impact on the power grid.



1 Pre-charge relays:

HFE82P-20

2 Main relays:

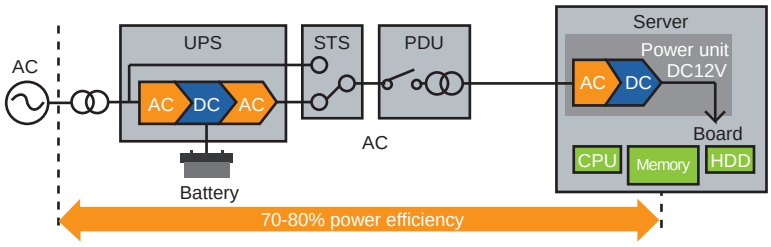
HFE85P-150, HFE85P-250, HFE85P-350,
HFE88P-150, HFE88P-250, HFE88P-350,

Cloud Servers and UPS

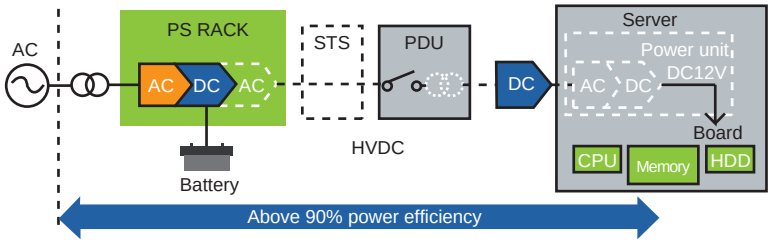
HVDC power supply systems can exceed 90% of energy efficiency compared to standard systems.

UPS DC power supply devices in the data center can convert the single-phase 200VAC of commercial power into 380VDC, then supply power for end applications. This reduces power consumption losses caused by conversion by more than 97%, while also reducing the power consumption required to air condition the servers.

Standard AC Server



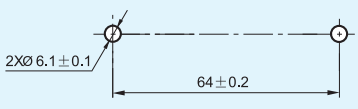
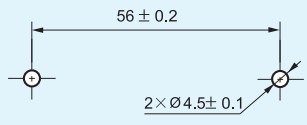
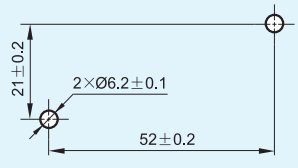
HVDC 12V



◆ Compared to AC power conversion, DC power supply mode can sav es 10%-20% of the power.

HFE82V

Electric & Hybrid Vehicles

Type		HFE82V-20	HFE82V-40	HFE82V-60B
Appearance				
Dimensions(mm)		78 x 39.8 x 46.1	67.0 × 32.6 × 47.0	64.0×33.0×52.8
Contact Arrangement		1H	1H	1H
Contact Resistance		4.5mΩ max.(at 20A)	3mΩ max.(at 40A)	1mΩ max.(at 60A)
Operation Voltage		75% Un max.	75% Un max.	75% Un max.
Rated Load Current		20A	40A	60A
Load Voltage		450V Type	450V Type	450V Type
Max Breaking Current		200A (1000VDC,1op)	400A (300VDC,1op)	600A (450VDC,1op)
Max Switching Voltage		1000VDC	800VDC	800VDC
Max Switching Power		18kW	36kW	54kW
Electrical Endurance		Switching：7.5×10^4 ops（450V/20A） Switching：5×10^4 ops（750V/20A） Switching：3×10^4 ops（1000V/20A）	Switching：2×10^4 ops（450V/40A） Making：7.5×10^4 ops（450V/40A） Switching：1×10^3 ops（750V/40A） Making：7.5×10^4 ops（750V/40A）	Making：7.5×10^4 ops（450V/60A） Making：5×10^4 ops（750V/60A） Switching：1×10^3 ops（450V/60A） Breaking：2×10^4 ops（750V/30A）
Dielectric Strength	Between Coil & Contacts	4000VAC 1min	4000VAC 1min	3600VAC 1min
	Between Open Contacts	3000VAC 1min	3000VAC 1min	3000VAC 1min
Mechanical Endurance		2×10^5 ops	2×10^5 ops	2.5×10^5 ops
Coil	Nominal Voltage (DC)	12, 24	12, 24	12, 24
	Coil Power	2.6W	3.0W	5.2W
Coil Input Terminal		QC	Wire	Wire
Load Input Terminal		QC	Screw terminal male	Screw terminal male
Unit Weight		Approx. 140g	Approx. 158g	Approx. 170g
Vibration		10Hz to 500Hz 49m/s^2	10Hz to 500Hz 49m/s^2	10Hz to 500Hz 49m/s^2
Humidity		5% to 85% RH	5% to 85% RH	5% to 85% RH
Ambient Temperature		-40˚C to 85˚C	-40˚C to 85˚C	-40˚C to 85˚C
Layout (Bottom View)				

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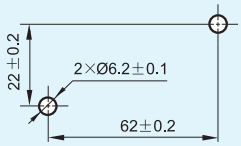
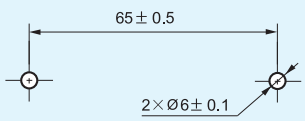
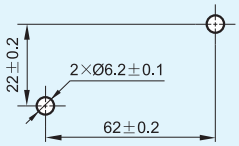
HFE82V

Electric & Hybrid Vehicles

Type		HFE82V-100D	HFE82V-150F	HFE82V-150D
Appearance				
Dimensions(mm)		76.0 × 40.0 × 75.0	77.0 × 37.7 × 71.3	76.0 × 36.0 × 66.8
Contact Arrangement		1H	1A	1H
Contact Resistance		1mΩ max.(at 20A)	0.5mΩ max.(at 150A)	0.5mΩ max.(at 150A)
Operation Voltage		75% Un max.	75% Un max.	75% Un max.
Rated Load Current		100A	150A	150A
Load Voltage		450V Type	500V Type	450V Type
Max Breaking Current		1000A (300VDC,1op)	1300A (400VDC,1op)	1200A (300VDC,1op)
Max Switching Voltage		800VDC	800VDC	800VDC
Max Switching Power		90kW	150kW	135kW
Electrical Endurance		Switching: 1×10^3 ops（450V/100A） Switching: 3×10^3 ops（200V/120A） Switching: 1×10^2 ops（750V/100A）	Breaking: 5×10^4 ops (475VDC, 20A) Making: 7×10^4 ops (20VDC, 100A) Breaking: 1×10^3 ops (450VDC, 150A) Breaking: 1 op (400VDC, 1300A) Short ciruit current: 1 op (6000A/5ms)	Switching: 1×10^3 ops（450V/150A） Switching: 3×10^3 ops（200V/120A） Switching: 1×10^2 ops（750V/150A）
Dielectric Strength	Between Coil & Contacts	4000VAC 1min	4000VAC 1min	4000VAC 1min
	Between Open Contacts	3000VAC 1min	3000VAC 1min	3000VAC 1min
Mechanical Endurance		2×10^5 ops	2×10^5 ops	2×10^5 ops
Coil	Nominal Voltage (DC)	12, 24	12, 24	12, 24
	Coil Power	5.5W	6.0W	5.5W
Coil Input Terminal		Wire	QC	Wire
Load Input Terminal		Screw terminal male	Screw terminal male	Screw terminal male
Unit Weight		Approx. 310g	Approx. 350g	Approx. 280g
Vibration		10Hz to 500Hz 49m/s^2	10Hz to 500Hz 49m/s^2	10Hz to 500Hz 49m/s^2
Humidity		5% to 85% RH	5% to 85% RH	5% to 85% RH
Ambient Temperature		-40˚C to 85˚C	-40˚C to 85˚C	-40˚C to 85˚C
Layout (Bottom View)				

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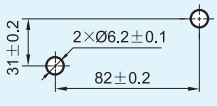
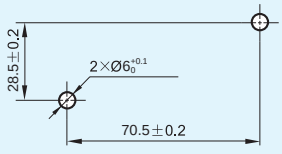
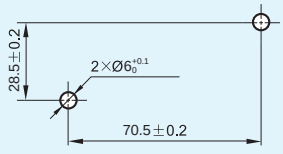
HFE82V

Electric & Hybrid Vehicles

Type		HFE82V-250	HFE82V-250C	HFE82V-300C
Appearance				
Dimensions(mm)		95.0 × 45.0 × 85.0	88.3 × 42.5 × 74.5	88.3 × 42.5 × 74.5
Contact Arrangement		1H	1H	1H
Contact Resistance		0.2mΩ max.(at 250A)	0.5mΩ max.(at 250A)	0.5mΩ max.(at 250A)
Operation Voltage		75% Un max.	75% Un max.	75% Un max.
Rated Load Current		250A	250A	300A
Load Voltage		450V Type	500V Type	500V Type
Max Breaking Current		2000A (450VDC,1op)	2000A (450VDC,1op)	2000A (750VDC,1op)
Max Switching Voltage		800VDC	800VDC	800VDC
Max Switching Power		225kW	250kW	300kW
Electrical Endurance		Making: 2.5 ×10^4 ops (22.5VDC, 250A) Switching: 1×10^3 ops (450VDC, 250A) Switching: 5×10^2 ops (750VDC, 250A) Breaking: 50 ops (450VDC,400A)	Breaking: 1 ×10^3 ops (450VDC, 250A) Breaking: 1×10^3 ops (450VDC, -250A) Breaking: 2×10^2 ops (750VDC, 250A) Breaking: 2×10^2 ops (750VDC, -250A)	Breaking: 1 ×10^3 ops (450VDC, 300A) Breaking: 1×10^3 ops (450VDC, -300A) Breaking: 5×10^2 ops (750VDC, 300A) Breaking: 5×10^2 ops (750VDC, -300A)
Dielectric Strength	Between Coil & Contacts	4000VAC 1min	2600VAC 1min	2600VAC 1min
	Between Open Contacts	3000VAC 1min	2600VAC 1min	2600VAC 1min
Mechanical Endurance		2×10^5 ops	2×10^5 ops	2×10^5 ops
Coil	Nominal Voltage (DC)	12, 24	12, 24	12, 24
	Coil Power	6.0W	6.0W	6.0W
Coil Input Terminal		Wire	Connector	Connector
Load Input Terminal		Screw terminal male	Screw terminal male	Screw terminal male
Unit Weight		Approx. 580g	Approx. 340g	Approx. 340g
Vibration		10Hz to 500Hz 49m/s^2	10Hz to 500Hz 49m/s^2	10Hz to 500Hz 49m/s^2
Humidity		5% to 85% RH	5% to 85% RH	5% to 85% RH
Ambient Temperature		-40˚C to 85˚C	-40˚C to 85˚C	-40˚C to 85˚C
Layout (Bottom View)				

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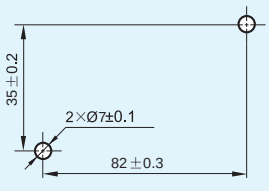
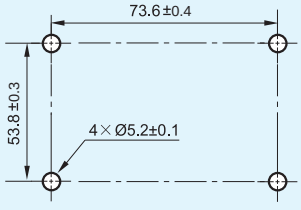
HFE82V

Electric & Hybrid Vehicles

Type		HFE82V-400M	HFE82V-600
Appearance			
Dimensions(mm)		88.3 × 42.5 × 74.5	146.0 × 66.6 × 132.8
Contact Arrangement		1H	1H
Contact Resistance		0.5mΩ max.(at 250A)	0.15mΩ max.(at 20A)
Operation Voltage		75% Un max.	75% Un max.
Rated Load Current		400A	600A
Load Voltage		450V Type	450V Type
Max Breaking Current		2000A (450VDC,1op)	2500A (800VDC,1op)
Max Switching Voltage		800VDC	800VDC
Max Switching Power		360kW	600kW
Electrical Endurance		Breaking: 1.5 ×10^4 ops (22.5VDC, 400A) Breaking: 1×10^3 ops (450VDC, 400A) Breaking: 5×10^3 ops (450VDC, -400A) Breaking: 1×10^2 ops (750VDC, 400A)	Making: 5 ×10^4 ops (750VDC, 120A) Switching: 5×10^2 ops (750VDC, 600A) Switching: 1×10^3 ops (750VDC, -300A) Switching: 1×10^2 ops (1000VDC, 600A)
Dielectric Strength	Between Coil & Contacts	3000VAC 1min	4000VAC 1min
	Between Open Contacts	3000VAC 1min	3000VAC 1min
Mechanical Endurance		2×10^5 ops	2×10^5 ops
Coil	Nominal Voltage (DC)	12, 24	12, 24
	Coil Power	6.0W	Driving:50.0W, Holding:10.0W
Coil Input Terminal		Connector	Connector
Load Input Terminal		Screw terminal male	Screw terminal male
Unit Weight		Approx. 340g	Approx. 1850g
Vibration		10Hz to 500Hz 49m/s^2	10Hz to 500Hz 49m/s^2
Humidity		5% to 85% RH	5% to 85% RH
Ambient Temperature		-40˚C to 85˚C	-40˚C to 85˚C
Layout (Bottom View)			

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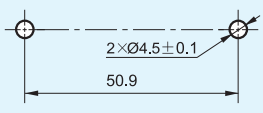
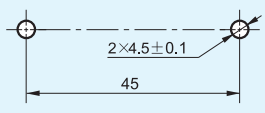
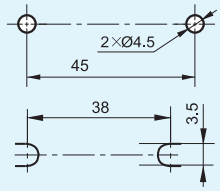
HFE80V

Pre-charge Solution

Type		HFE80V-20B	HFE80V-20C	HFE80V-40
Appearance				
Dimensions(mm)		40.0 x 30.0 x 42.7	30.1 x 30.0 x 29.2	30.1 x 30.0 x 29.2
Contact Arrangement		1H	1H	1H
Contact Resistance		5mΩ max.(at 20A)	5mΩ max.(at 20A)	5mΩ max.(at 20A)
Operation Voltage		75% Un max.	75% Un max.	75% Un max.
Rated Load Current		20A	20A	40A
Load Voltage		450V	450V	450V
Max Breaking Current		30A (450VDC,5ops)	30A (450VDC,5ops)	50A (450VDC,1ops)
Max Switching Voltage		750VDC	750VDC	750VDC
Max Switching Power		18kw	18kw	27kw
Electrical Endurance		Making: 7.5×10^4 ops (450V/20A) Switching: 1×10^4 ops (450V/10A) Switching: 3×10^3 ops (450V/20A)	Making: 7.5×10^4 ops (450V/20A) Switching: 1×10^4 ops (450V/10A) Switching: 3×10^3 ops (450V/20A)	Making: 7.5×10^4 ops (450V/35A) Switching: 1×10^4 ops (450V/10A) Switching: 1×10^3 ops (450V/40A)
Dielectric Strength	Between Coil & Contacts	3000VAC 1min	3000VAC 1min	3000VAC 1min
	Between Open Contacts	2000VAC 1min	2000VAC 1min	2000VAC 1min
Mechanical Endurance		2×10^5 ops	2×10^5 ops	2×10^5 ops
Coil	Nominal Voltage (DC)	12, 24	12, 24, 48	12, 24, 48
	Coil Power	3W	3W	3W
Coil Input Terminal		QC or PCB	QC or PCB	QC or PCB
Load Input Terminal		QC or PCB	QC or PCB	QC or PCB
Unit Weight		Approx. 59g	Approx. 50g	Approx. 51g
Vibration		10Hz to 500Hz 49m/s^2	10Hz to 500Hz 49m/s^2	10Hz to 500Hz 49m/s^2
Humidity		5% to 85% RH	5% to 85% RH	5% to 85% RH
Ambient Temperature		-40˚C to 85˚C	-40˚C to 85˚C	-40˚C to 85˚C
Layout (Bottom View)				

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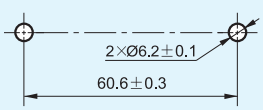
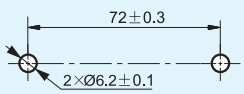
HFE80V | Pre-charge Solution | 48Vdc Battery Systems

Type		HFE80V-80	HFE80V-100B
Appearance			
Dimensions(mm)		55.1 x 42.6 x 38.9	50.6 x 23.0 x 57.0
Contact Arrangement		1A	1A
Contact Resistance		≤1.5mΩ（at 20A）	1.5mΩ max.(at 100A)
Operation Voltage		75% Un max.	75% Un max.
Rated Load Current		60A	100A
Load Voltage		200V	60V
Max Breaking Current		100A (200VDC 1op)	800A (52VDC,1ops)
Max Switching Voltage		250VDC	60VDC
Max Switching Power		24kw	12kw
Electrical Endurance		Switching：5x10⁴ ops（48V/60A） Switching：3x10⁴ ops（72V/60A） Switching：1x10⁴ ops（150V/60A） Switching：7.5x10⁴ ops（150V/10A） Switching：5000 ops（200V/60A） Switching：5000 ops（250V/40A） Switching：2000 ops（250V/60A）	Making：6x10⁴ ops（52V/+3A） Making：2x10⁴ ops（52V/+10A） Breaking：6x10⁴ ops（52V/+3A） Breaking：2x10⁴ ops（52V/+10A） Breaking：500 ops（52V/±30A） Breaking：50 ops（52V/+250A） Breaking：50 ops（52V/-220A）
Dielectric Strength	Between Coil & Contacts	2500VAC 1min	3000VAC 1min
	Between Open Contacts	3000VAC 1min	3000VAC 1min
Mechanical Endurance		2×10⁵ ops	2×10⁵ ops
Coil	Nominal Voltage (DC)	12	12
	Coil Power	3W	3W
Coil Input Terminal		P: PCB terminal	L: wire
Load Input Terminal		P: PCB terminal	Screw（M6）
Unit Weight		Approx. 200g	Approx. 155g
Vibration		10Hz to 500Hz 49m/s²	10Hz to 1000Hz 27.1m/s²
Humidity		5% to 85% RH	5% to 85% RH
Ambient Temperature		-40˚C to 75˚C	-40˚C to 75˚C
Layout (Bottom View)			

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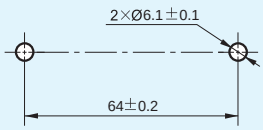
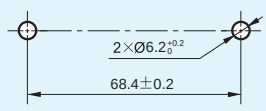
HFE82P& HFE85P

PV& Energy Storage Solutions

Type		HFE82P-20	HFE85P-150
Appearance			
Dimensions(mm)		78x39.8x46.1	80.4 x 62.3 x 72.8
Contact Arrangement		1H	1H, 1A
Contact Resistance		4.5mΩ max.(at 20A)	0.3mΩ max.(at 150A)
Operation Voltage		80% Un max.	80% Un max.
Rated Load Current		20A	150A
Load Voltage		1000V Type	1000V Type
Max Breaking Current		200A （1000VDC,1op）	2000A （320VDC,1ops）
Max Switching Voltage		1500VDC	1000VDC
Max Switching Power		20kw	300kw
Electrical Endurance		Switching：1×10^4 ops（1000V/15A） Switching：1×10^4 ops（1500V/15A） Making：1.5×10^4 ops（1500V/40A）	Making：7.5×10^4 ops（37.5V/150A） Breaking：3000 ops（450V/150A） Breaking：200 ops（450V/-150A） Breaking：1500 ops（750V/150A） Breaking：100 ops（750V/-150A） Breaking：1000 ops(1000V/150A) Breaking：1 ops(320V/1000A)
Dielectric Strength	Between Coil & Contacts	4000VAC 1min	3300VAC 1min
	Between Open Contacts	4000VAC 1min	3300VAC 1min
Mechanical Endurance		2×10^5 ops	2×10^5 ops
Coil	Nominal Voltage (DC)	12, 24	12, 24
	Coil Power	2.6W	Making: 26W，Holding: 3W
Coil Input Terminal		QC	Wire
Load Input Terminal		QC	Bolt terminal female
Unit Weight		Approx. 160g	Approx. 400g
Vibration		10Hz to 55Hz, 1.5mm double amplitude	10Hz to 55Hz, 1.5mm double amplitude
Humidity		5% to 85% RH	5% to 85% RH
Ambient Temperature		-40˚C to 85˚C	-40˚C to 85˚C
Layout (Bottom View)			

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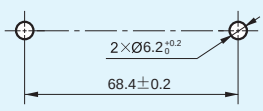
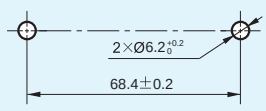
HFE85P

PV& Energy Storage Solutions

Type		HFE85P-250	HFE85P-300
Appearance			
Dimensions(mm)		80.4 x 62.3 x 72.8	80.4x62.3x72.8
Contact Arrangement		1H, 1A	1H, 1A
Contact Resistance		0.3mΩ max.(at 250A)	0.3mΩ max.(at 250A)
Operation Voltage		80% Un max.	80% Un max.
Rated Load Current		250A	300A
Load Voltage		1000V Type	1000V Type
Max Breaking Current		2000A （320VDC,1op）	2000A （320VDC,1op）
Max Switching Voltage		1000VDC	1000VDC
Max Switching Power		400kW	450kw
Electrical Endurance		Making：7.5×10^{4}ops（37.5V/250A） Breaking：1500 ops（450V/250A） Breaking：100 ops（450V/-250A） Breaking：500 ops（750V/250A） Breaking：50 ops（750V/-250A） Breaking：500 ops(1000V/250A) Breaking：1 ops(320V/2000A)	Making：7.5×10^4 ops（37.5V/300A） Breaking：1000 ops（450V/300A） Breaking：50 ops（450V/-300A） Breaking：500 ops（750V/300A） Breaking：20 ops（750V/-300A） Breaking：100 ops(1000V/300A) Breaking：1 ops(320V/2000A)
Dielectric Strength	Between Coil & Contacts	3300VAC 1min	3000VAC 1min
	Between Open Contacts	3300VAC 1min	3000VAC 1min
Mechanical Endurance		2×10^5 ops	2×10^5 ops
Coil	Nominal Voltage (DC)	12, 24	12
	Coil Power	Making: 26W，Holding: 3W	Making: 26W，Holding: 3W
Coil Input Terminal		Wire	Wire
Load Input Terminal		Bolt terminal female	Bolt terminal female
Unit Weight		Approx. 400g	Approx. 400g
Vibration		10Hz to 55Hz, 1.5mm double amplitude	10Hz to 55Hz, 1.5mm double amplitude
Humidity		5% to 85% RH	5% to 85% RH
Ambient Temperature		-40˚C to 85˚C	-40˚C to 85˚C
Layout (Bottom View)			

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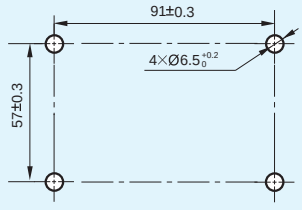
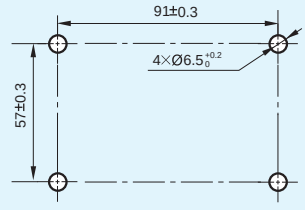
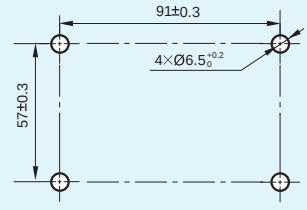
HFE85P

PV& Energy Storage Solutions

Type		HFE88P-150	HFE88P-250	HFE88P-350
Appearance				
Dimensions(mm)		104 x 70 x 107.9	104 x 70 x 107.9	104 x 70 x 107.9
Contact Arrangement		1H, 1A	1H, 1A	1H, 1A
Contact Resistance		0.3mΩ max.(at 150A)	0.3mΩ max.(at 250A)	0.3mΩ max.(at 350A)
Operation Voltage		80% Un max.	80% Un max.	80% Un max.
Rated Load Current		150A	250A	350A
Load Voltage		1500V Type	1500V Type	1500V Type
Max Breaking Current		1000A （1000VDC,1op）	1500A (1000VDC,1op)	2000A (1000VDC,1op)
Max Switching Voltage		1500VDC	1500VDC	1500VDC
Max Switching Power		450kW	500kW	700kW
Electrical Endurance		Switching：2000 ops（1500V/100A） Switching：1000 ops（1500V/150A） Breaking：1 ops(1500V/1000A)	Switching：3000 ops（1500V/100A） Switching：2000 ops（1500V/150A） Switching：1000 ops（1500V/250A） Breaking：1 ops(1000V/1500A) Breaking：1 ops(1500V/1000A)	Switching：5000 ops（1500V/100A） Switching：3000 ops（1500V/150A） Switching：1000ops（1500V/350A） Breaking：1 ops(1000V/2000A) Breaking：1 ops(1500V/1000A)
Dielectric Strength	Between Coil & Contacts	4000VAC 1min	4000VAC 1min	4000VAC 1min
	Between Open Contacts	4000VAC 1min	4000VAC 1min	4000VAC 1min
Mechanical Endurance		1×10^5 ops	1×10^5 ops	1×10^5 ops
Coil	Nominal Voltage (DC)	12, 24	12, 24	12, 24
	Coil Power	Making: 50W，Holding: 5W	Making: 50W，Holding: 5W	Making: 50W，Holding: 5W
Coil Input Terminal		Connector	Connector	Connector
Load Input Terminal		Bolt terminal female	Bolt terminal female	Bolt terminal female
Unit Weight		Approx. 1150g	Approx. 1150g	Approx. 1150g
Vibration		10Hz to 55Hz , 1.5mm double amplitude	10Hz to 55Hz , 1.5mm double amplitude	10Hz to 55Hz , 1.5mm double amplitude
Humidity		5% to 85% RH	5% to 85% RH	5% to 85% RH
Ambient Temperature		-40˚C to 85˚C	-40˚C to 85˚C	-40˚C to 85˚C
Layout (Bottom View)				

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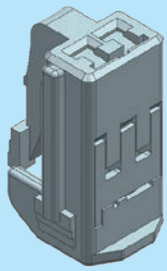
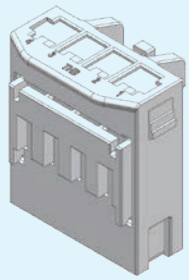
Suggested Connectors

Connector feature	Matched HVDC Relay Supplier	Supplier	Outline drawing	Connector PN
2PIN	HFE82V-200B HFE82V-250C	Yazaki		7283-1020
		THB		0435S eries
		KET		MG651026
4PIN	HFE82V-200W HFE88P	Yazaki		—
		THB		04387 Series
		KET		MG651038