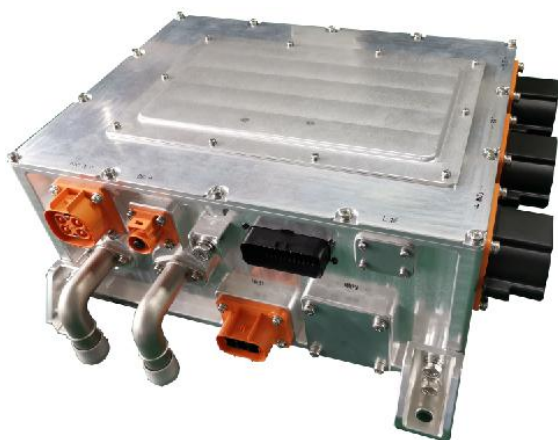


GQ021**OBC: 85-265Vac input; 200-420Vdc output; 6600W
DC/DC: 200-450Vdc input; 13.8Vdc output; 2000W****1.Product introduction:****1.1 Overview**

This product integrates OBC, DC-DC module and PDU unit, OBC output 6.6KW, DC-DC output 2KW (peak 2.4KW), adopts water-cooled heat dissipation, meets IP67 level, small size, high efficiency, stable work, CAN bus Communication, voltage and current can be set in real time, with input over-voltage protection, output over-current protection, output over-voltage protection, output short-circuit protection, over-temperature protection and other functions.

1.2.Main features:

Dimensions: 346mm×342mm×168mmGQ

Whole machine weight: 20KG

OBC module efficiency: 95%

DC-DC module efficiency: 94%

OBC module output ripple and noise: $\leq 2\%V_o$ DC-DC module output ripple and noise: $\leq 300\text{mVpp}$

OBC and DC-DC module high voltage DC reverse connection protection

Input over voltage protection

Output over current and short circuit protection
(automatically recoverable)

Over temperature protection (automatically recoverable)

Working temperature: $-40\text{---}+85^{\circ}\text{C}$ MTBF: $\geq 300,000\text{Hrs}$ **1.3.Application scenarios:**

Suitable for all kinds of pure electric/hybrid/extended programs, etc.
new energy vehicles

2. Main product specifications:

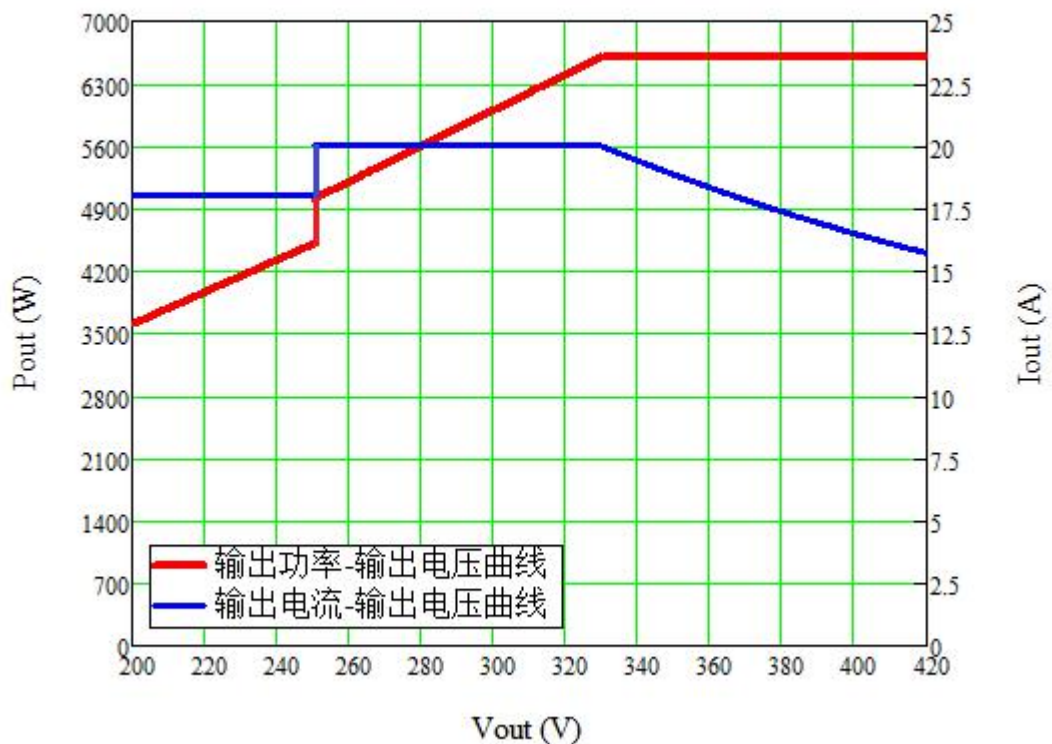
Operating mode	Input voltage range	Rated output voltage	Output voltage range	Output current	Output Power
OBC	85-264Vac	366Vdc	200-420Vdc	0-20A	6.6KW (max)
DC-DC	200-450Vdc	13.8Vdc	/	0-145A	2KW (rated)

3. Electrical performance:

Item	Min	typical	Max	unit	condition
Environmental conditions					
Working environment condition	range of working temperature	-40	+85	$^{\circ}\text{C}$	
	Relative humidity	-	95	$^{\circ}\text{C}$	
	Altitude	-	5	m	

GQ021**OBC: 85-265Vac input; 200-420Vdc output; 6600W
DC/DC: 200-450Vdc input; 13.8Vdc output; 2000W**

s				000		
	Cooling method	Water cooling			/	Coolant temperature $\leq 65^{\circ}\text{C}$, flow rate 12L/min
	Protection level	IP67			/	
Storage conditions	Storage temperature	-40	-	+85	$^{\circ}\text{C}$	
	Relative humidity	5	-	95	%	
	Altitude	-	-	5000	m	
OBC electrical performance						
1. Input characteristics						
Rated input voltage		-	220	-	V _{ac}	
Input voltage range		85	-	265	V _{ac}	
Maximum input current		-	-	32	A	220Vac input, full load. When the input is less than 220Vac, the output power of the charger will be automatically derated so that the input current is $\leq 32\text{A} \pm 3\text{A}$.
AC input voltage frequency		45	50/60	65	Hz	
Power factor		0.99	-	-	-	input 220Vac, $P_o \geq 4.5\text{KW}$
Overall efficiency		94.5	95	-	%	$V_o = 366\text{V}, I_o \geq 15\text{A}$
Starting impulse current		-	-	32	A	$V_{in} = 220\text{Vac}$
2. Output characteristics						
High voltage output	Rated output voltage	366			V _{dc}	<p>1. Under the condition of 110Vac input, the output power will automatically halve and run.</p> <p>2. The output power under the condition of input $\geq 220\text{Vac}$, the output current is as shown in the figure below:</p>
	Output voltage range	200	-	420	V _{dc}	
	Output current range	0	-	20	A	
	Rated output power			6.6	KW	



Output ripple and noise			3.5	%Vo	Io ≥ 8A
Power-on rise time			5	S	After the OBC receives the BMS boot command, the output voltage rises from 10% to 90%
Output fall time			500	mS	After the OBC receives the BMS stop command, the time for the output current to decrease to 0A
Output steady current accuracy	-2		2	%	More than 25% of rated current condition test
Static current consumption			3	mA	Sleep without gun, consume KL30 constant current

Temperature Coefficient	-	-	±0.02	%/°C	
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3. Protection features

Input overvoltage protection	275		295	Vac	Turn off the output, output 366V/2A test
Input overvoltage recovery	265		285	Vac	Hysteresis ≥ 5Vac, output 366V/2A test
Input undervoltage protection	65		80	Vac	Turn off the output, output 366V/2A test
Input undervoltage recovery	70		85	Vac	Hysteresis ≥ 5Vac, output 366V/2A test
Input overcurrent protection			3 5	A	When the input overcurrent state lasts for ≥ 3s, the power of the charger will be automatically derated. If the input current does not fall below the

						limit within 30s, the charger will turn off the high-voltage output
High voltage output	Output overvoltage protection	430	-	460	Vdc	Turn off the high-voltage output, lock it, and restart the power supply
	Output undervoltage protection	170	-	190	Vdc	Turn off the high voltage output, it can be restored after troubleshooting
	Output overcurrent protection	20		24	A	
	Output short circuit protection	Have				Before entering the charging process, when an output short circuit is detected, charging is not started. The output is short-circuited during the charging process, and the high-voltage output is immediately turned off
	Output reverse connection protection	Have				The output is reversed, the high-voltage output does not start, and the normal operation is restored after the fault is removed
Communication failure protection		Have			-	When the charger does not receive the BMS instruction for 5 consecutive seconds, or there is a communication failure during the operation of the charger, the charger will turn off the output
Over temperature protection		≥ 65			$^{\circ}\text{C}$	The temperature of the bottom plate exceeds 65°C for a duration of $\geq 5\text{S}$, and the high-voltage output power is halved. When the temperature drops to $\leq 60^{\circ}\text{C}$, the charger returns to normal power.
		≥ 80				If the temperature of the bottom plate exceeds 80°C and the duration is $\geq 5\text{S}$, the high voltage output will be turned off. When the temperature drops to $\leq 65^{\circ}\text{C}$, the charger resumes output.

DC-DC electrical performance**1. Input characteristics**

Nominal input voltage range	200	366	450	Vdc	
Input maximum current	-	-	11	A	Vin=250Vdc, full output

Static current consumption	-	-	1	^m A	Test with rated input and power off
2. Output characteristics					
Rated output voltage	13.8±0.3			^V dc	Rated input and output half load
Output current	-	145	174	A	
Output Power	-	2000	2400	W	
Peak power	-	-	2400	W	Working time ≤ 6 minutes
Output ripple and noise	-	-	300	^m Vpp	Rated input voltage, 20% load or more, test under normal temperature conditions, oscilloscope bandwidth 20MHz, probe 10uF+104 capacitor in parallel.
Overall efficiency		94	-	%	Rated input voltage, under 50% load condition
Stabilization accuracy	-	-	±2	%	
Steady flow accuracy	-	-	±2	%	
Output voltage rise time			200	^m S	The time for the output voltage to rise from 10% to 90%
Temperature Coefficient	-	-	±0.02	% /°C	
Dark current at output	-	-	2	^m A	Leakage current when the output terminal is connected to 14Vdc battery in parallel
3. Protection features					
Input overvoltage protection point	460		480	Vdc	
Input overvoltage recovery point	450		470	Vdc	
Input undervoltage protection point	170		190	Vdc	
Input undervoltage recovery point	180		200	Vdc	
Over temperature protection	Have			°C	When the temperature of the power supply bottom board rises from 80°C to 90°C, the output current decreases linearly with the temperature; when the power supply bottom temperature exceeds 90°C, the power supply turns off the output
Output overcurrent protection	Have			A	1) When the input voltage is higher than 250V, in CV mode, the current limit point for the first 6 minutes is 174A±5A; after 6 minutes, the

					current limit point is 145A±5A; 2) When the input voltage is higher than 250V, in CC mode, the current limit point is 174A±10A in the first 6 minutes; after 6 minutes, the current limit point is 145A±10A; 3) When the input voltage is lower than 245V and higher than 195V, the output current is linearly derated	
Output short circuit protection		Have		/	Hiccup, self-recovery when the fault is removed.	
Output overvoltage protection		15		18	V	Self-recoverable
Item		Technical index				Remarks
Safety characteristics						
Dielectric strength	AC input-high voltage output	2500Vac/10mA/ 1min/50HZ			OBC unit test, no breakdown or arcing	
	AC input-earth	2500Vac/10mA/ 1min/50HZ				
	High voltage output-earth	2500Vac/10mA/ 1min/50HZ				
	DC input-low voltage 14V output	2828Vdc/10mA/ 1min			DC-DC unit test, no breakdown or arcing	
Insulation resistance	AC input-high voltage output	> 50M Ω @1000Vdc			OBC unit test, normal air pressure, 90% relative humidity test	
	AC input-low voltage 14V output, earth					
	High voltage output-low voltage 14V output, earth					
	DC input-low voltage 14V output	> 50M Ω @1000Vdc			DC-DC unit test, normal air pressure, 90% relative humidity test	
Contact current	Input-shell	<3.5mA			OBC unit test, 265Vac/60Hz input	

re																						
nt																						
EMC characteristics																						
Test items	Guideline	Performance	Criterion	Remarks																		
1. EMI test ★																						
Conduct ed Harassment (CE)	GB/T 18487.3-2001 EN 55032 CISPR 25:2016	AC side: CLASS B High voltage input/output: HV -LEVEL 3 Low voltage input/output: LV-LEVEL 3	/	According to CISPR 25:2016 Venue requirements layout																		
Radiated harassment (RE)	GB/T 18487.3-2001 CISPR 25:2016	Whole machine: LEVEL 3	/																			
2. EMS test ★																						
Electrost atic discharge (ESD)	GB/T 18487.3-2001 GB/T 17626.2-1998	<table><tr><td rowspan="4">上电状 态</td><td>接触放电± 8kV</td><td>L3</td></tr><tr><td>接触放电± 15kV</td><td>L4</td></tr><tr><td>空气放电± 15kV</td><td>L3</td></tr><tr><td>空气放电± 25kV</td><td>L4</td></tr><tr><td rowspan="4">不上电 状态</td><td>接触放电± 8kV</td><td>L3</td></tr><tr><td>接触放电± 15kV</td><td>L4</td></tr><tr><td>空气放电± 15kV</td><td>L3</td></tr><tr><td>空气放电± 25kV</td><td>L4</td></tr></table>	上电状 态	接触放电± 8kV	L3	接触放电± 15kV	L4	空气放电± 15kV	L3	空气放电± 25kV	L4	不上电 状态	接触放电± 8kV	L3	接触放电± 15kV	L4	空气放电± 15kV	L3	空气放电± 25kV	L4	B	/
上电状 态	接触放电± 8kV	L3																				
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	空气放电± 15kV	L3																				
	空气放电± 25kV	L4																				
Radiated electromagnetic field immunity free field method	GB/T 17619-1998 ISO 11452-2-2004	Test frequency band: 400MHz--1000MHz, Test severity level 75V/m, 100V/m	75V/m, A, 100V/m, A																			
Radiated electromagnetic field immunity high current injection (BCI)	GB/T 17619-1998 ISO 11452-4-2005	Test frequency band: 1MHz--400MHz, Test severity level 75mA, 100mA	75mA, A, 100mA , A																			
Transien t immunity	GB/T 21437.2-2008 (ISO 7637-2)	<table><tr><td rowspan="8">沿电源 线的瞬 态抗扰 度测试</td><td>Pulse 1</td><td>L2</td></tr><tr><td>Pulse 2a</td><td>L2</td></tr><tr><td>Pulse 2b</td><td>L2</td></tr><tr><td>Pulse 3a</td><td>L2</td></tr><tr><td>Pulse 3b</td><td>L2</td></tr><tr><td>staring profile</td><td>B</td></tr><tr><td>load dump</td><td>C</td></tr><tr><td></td><td></td></tr></table>	沿电源 线的瞬 态抗扰 度测试	Pulse 1	L2	Pulse 2a	L2	Pulse 2b	L2	Pulse 3a	L2	Pulse 3b	L2	staring profile	B	load dump	C			Pulse 1, Pulse 2b is D, Pulse 2a, Pulse 3a/3b is A		
沿电源 线的瞬 态抗扰 度测试	Pulse 1	L2																				
	Pulse 2a	L2																				
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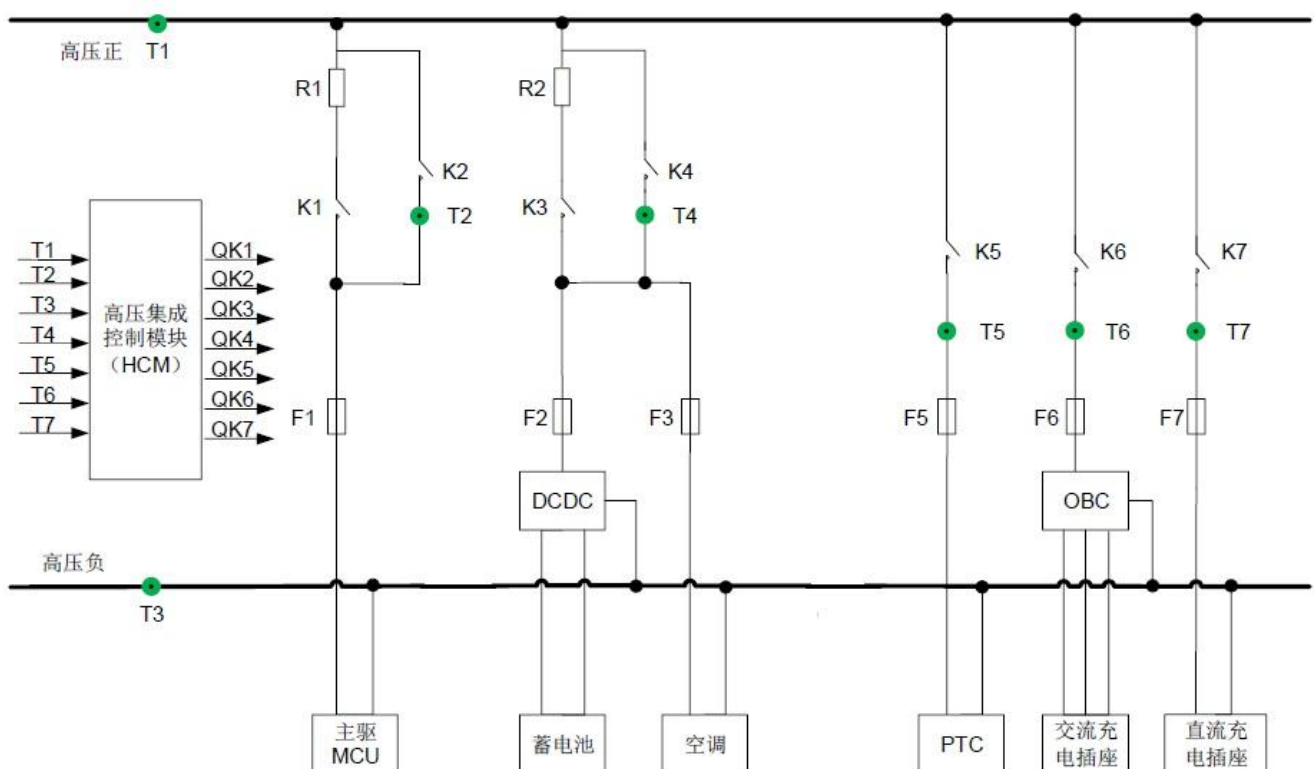
		<table><tr><td>信号/ 控制线 的瞬态 抗扰度 测试</td><td>Pulse a Pulse b</td><td>C C</td></tr></table>	信号/ 控制线 的瞬态 抗扰度 测试	Pulse a Pulse b	C C	/	
信号/ 控制线 的瞬态 抗扰度 测试	Pulse a Pulse b	C C					
/Class three fast pulse, slow pulse, criterion A							

Environmental test

NO.	Item	Technical index	Technical index
1	Low temperature test	fulfill the standard	GB/T 2423
2	High temperature test	fulfill the standard	GB/T 2423
3	vibration	fulfill the standard	ISO16750-3,2012(E)
4	Impact test	fulfill the standard	ISO16750,4.2.2.2

Electrical diagram and device parameters

PDU electrical connection diagram



1、Remarks:

1. The output voltage of the main drive follows the voltage of the high-voltage battery;
2. The PTC output voltage follows the high-voltage battery voltage;
4. The output voltage of the air conditioner follows the high-voltage battery voltage;

position	name	specification	model
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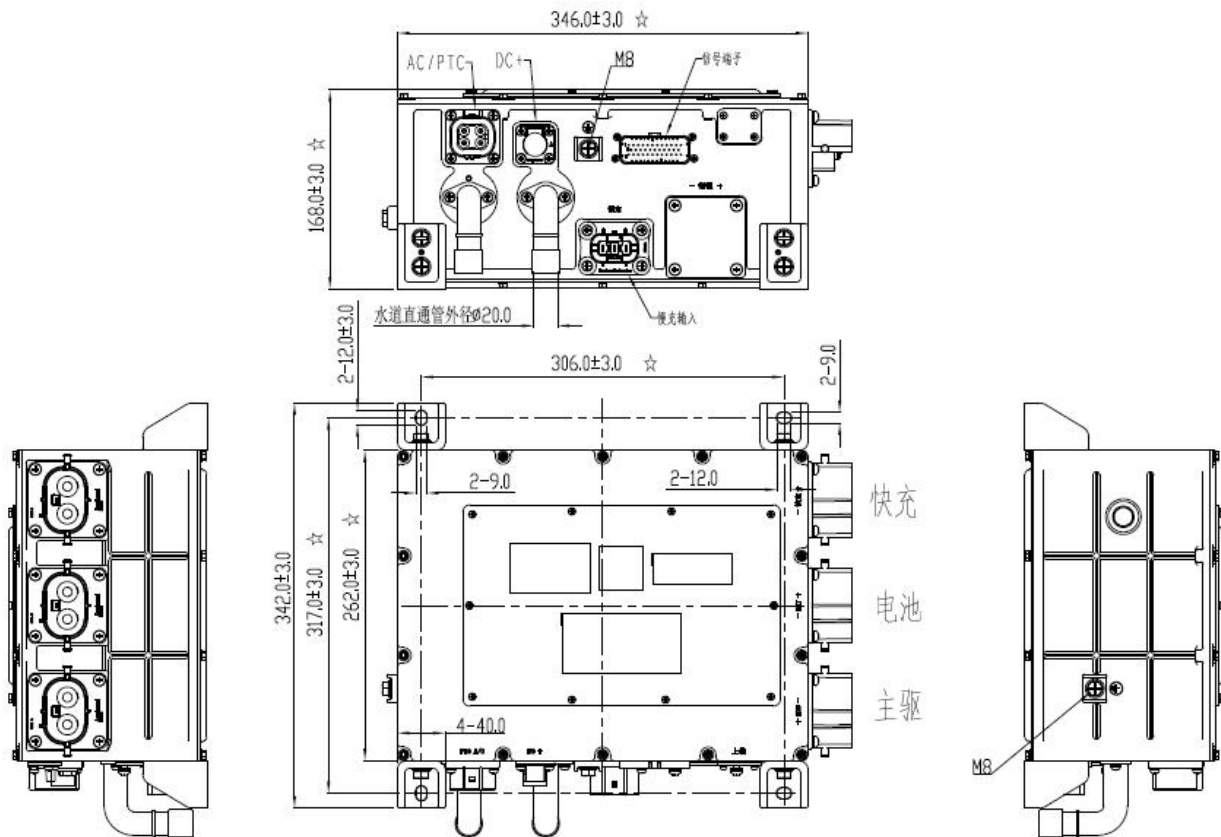
R1	High-voltage main circuit pre-charging resistance	/	
R2	High-voltage auxiliary control loop pre-charging resistance	/	
K1	High-voltage main circuit pre-charged contactor	20A/450V	Hongfa: HFE80V-20C/450-12-HTPAJ
K2	High-voltage main circuit positive contactor	250A/750V	Hongfa: HFE18V-250/750-12-HB5
K3	Auxiliary control loop pre-charged contactor	20A/450V	Hongfa: HFE80V-20C/450-12-HTPAJ
K4	Auxiliary control loop positive contactor	100A/750V	Hongfa: HFE18V-100/750-12-HB5
K5	PTC contactor	40A/750V	Hongfa: HFE18V-40/750-12-HB5
K6	AC charging contactor	40A/750V	Hongfa: HFE18V-40/750-12-HB5
K7	DC charging contactor	250A/750V	Hongfa: HFE18V-250/750-12-HB5
F1	Main drive fuse	300A/750VDC	Hongfa: RS309-MF-300A/750VDC
F2	DCDC fuse	32A/700VDC	Middle melting: EV322-4GL32A
F3	Electric air conditioner fuse	50A/700VDC	Middle melting: EV322-4GL50A
F5	PTC fuse	32A/700VDC	Middle melting: EV322-4GL32A
F6	AC charging fuse	50A/700VDC	Middle melting: EV322-4GL50A
F7	DC charging fuse	350A/750VDC	China Melt: RS309-MF-350A/750VDC

4. structure size and terminal definition₁.

Length × width × height ≤ 346mm × 342mm × 168mm

GQ021

OBC: 85-265Vac input; 200-420Vdc output; 6600W
DC/DC: 200-450Vdc input; 13.8Vdc output; 2000W



2. Signal connector definition:

Connector name and number	High-voltage auxiliary drive controller low-voltage control main connector				
Connector model	Product end: 776163-1, 35P, 4.0mm, black, TE; Client: 776164-1, 35P, 4.0mm, black, TE				
Icon					
33 function pins definition	Pin	Pin name	Pin parameters	Pin function definition	Remarks
	PIN1	12V power supply +	9~18V (6V 以上保证 CAN 通讯)	Low-voltage battery input positive	Normal power supply
	PIN2	12V power supply -		Low-voltage battery input negative	Normal power supply
	PIN3	NC	/	Empty feet	
	PIN4	CC1	High level: 6~18V Low level: 0~3.5V Frequency <100Hz	DC charging wake-up signal, high effective	Input wake
	PIN5	NC	/	Empty feet	
	PIN6	NC	/	Empty feet	
	PIN7	NC	/	Empty feet	

GQ021

OBC: 85-265Vac input; 200-420Vdc output; 6600W
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PIN8	NC	/	Empty feet	
PIN9	NC	/	Empty feet	
PIN10	NC	/	Empty feet	
PIN11	CAN2H	500K-1M CAN2.0	Vehicle communication CAN	
PIN12	CAN2L	Standard ISO11898		
PIN13	CAN2_GND	CAN2 shield ground		
PIN14	12V 供电正	9~18V (Above 6V guarantees CAN communication)	Low-voltage battery input positive	Normal power supply
PIN15	12V 供电负		Low-voltage battery input negative	Normal power supply
PIN16	CC2	High level: 6~18V Low level: 0~3.5V Frequency <100Hz	AC charging wake-up signal, high effective	Output wake up
PIN17	KL15	High level: 6~18V Low level: 0~3.5V Frequency <100Hz	Key signal, high effective	ON file
PIN18	NC	/	Empty feet	
PIN19	NC	/	Empty feet	
PIN20	CC		Slow charge connection signal	
PIN21	CP		Slow charge control guide	
PIN22	CC-OUT	Low level when CC is connected Low level when CC is half connected High level when CC is disconnected	Slow charge in place signal	Reserved
PIN23	NC	/	Empty feet	
PIN24	NC	/	Empty feet	
PIN25	NC	/	Empty feet	
PIN26	NC	/	Empty feet	
PIN27	NC	/	Empty feet	
PIN28	NC	/	Empty feet	
PIN29	NC	/	Empty feet	
PIN30	NC	/	Empty feet	
PIN31	NC	/	Empty feet	
PIN32	NC	/	Empty feet	
PIN33	NC	/	Empty feet	
PIN34	NC	/	Empty feet	
PIN35	NC	/	Empty feet	

3. Power interface

Socket name	Foot position	Socket definition	Socket model	Client
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GQ021

OBC: 85-265Vac input; 200-420Vdc output; 6600W
DC/DC: 200-450Vdc input; 13.8Vdc output; 2000W

battery	1	BAT-	HVC2PG80MV118 (Changzhou Amphenol)	HVC2PG80FS150
	2	BAT+		
Main drive	1	MCU+	HVC2PG80MV318 (Changzhou Amphenol)	HVC2PG80FS350
	2	MCU-		
Fast charge	1	Fast charge input-	HVC2PG80MV218 (Changzhou Amphenol))	HVC2PPG80FS250
	2	Fast charge input+		
Slow charge AC input	1	AC input N	HVC3P63MV106 (Changzhou Amphenol)	HVC3P63FS106
	2	AC input PE		
	3	AC input L		
DC/DC	/	DC+	HVSC1P80MV101 (Changzhou Amphenol)	HVSC1P80FS135
	/	DC- (Connect to the shell)		
PTC/air conditioning	1	PTC+	HVC4P36MV102 (Changzhou Amphenol)	HVC4P36FS102
	2	PTC-		
	3	A/C+		
	4	A/C-		

5. CAN communication:

NO.	Items	Technical indicators	Remarks
1	Baud rate	500K	
2	CAN bus communication protocol	Comply with CAN2.0 specification	/
3	Terminating resistor	/	No terminal resistance

6. reference standards and norms**1. OBC part:**

GB/T 2423.1-2001 Environmental testing of electrical and electronic products, Part 2: Test method/Test A: Low temperature

QC/T895-2011 Conductive on-board charger for electric vehicles

Technical requirements of QC/T conductive on-board charger for electric vehicles

GB/T 20234-2006 General requirements for plugs, sockets, vehicle couplers and vehicle jacks for conductive charging of electric vehicles;

GB/T 18487.1-2015 Electric Vehicle Conductive Charging System General Requirements;

GB/T 18487.2-2001 Electric Vehicle Conductive Charging System Requirements for the connection of electric vehicles and AC/DC power supply;

GB/T 18487.3-2001 Electric Vehicle Conductive Charging System Electric Vehicle AC/DC Charger (Station)

In the design process, the charger should be standardized and designed according to the standard.

2. DC/DC part:

QC/T 413-2002 Basic technical conditions for automotive electrical equipment

QC/T 895-2011 Conductive on-board charger for electric vehicles

GB/T 2423.1-2008 Environmental testing of electric and electronic products Part 2: Test method Test A: Low temperature

GB/T 2423.2-2008 Environmental testing of electric and electronic products Part 2: Test method Test B: High temperature

GB/T 17626.2-2006 Electromagnetic compatibility test and measurement technology Electrostatic discharge immunity test

GB/T 17626.3-2006 Electromagnetic compatibility test and measurement technology Radio frequency electromagnetic field radiation immunity test

GB/T 17626.4-2008 Electromagnetic compatibility test and measurement technology Electrical fast transient pulse group immunity test

GB/T 17626.5-2008 Electromagnetic compatibility test and measurement technology Surge (impact) immunity test

GB 9254-2008 Information Technology Equipment Radio Disturbance Limits and Measurement Methods

GB/T 18384.3-2015, Safety Requirements for Electric Vehicles (Part 3: Personal Electric Shock

Protection)

GB/T 17619 Electromagnetic Radiation Immunity Limits and Measurement Methods of Motor Vehicle

Electronic and Electrical Components

GB/T 18488.1-2006 Drive motor system for electric vehicles Part 1: Technical conditions

GB/T 24347-2009 DC/DC converters for electric vehicles

GB/T 19826-2005 General technical conditions and safety requirements for DC power supply equipment in power engineering

GB 4208-2008 Enclosure protection grade (IP code)

GB/T 18655-2010 Measurement, Ship and Internal Combustion Engine Radio Disturbance Characteristics Used to Protect Vehicle-mounted Receiver Limits and Measurement Methods

Q/FT B102-2005 Traceability Marking Regulations for Parts and Components of Vehicle Products

GB/T 2423.3-1993 Basic environmental test procedures for electrical and electronic products—Test

Ca: Constant humidity test method;

GB/T 2423.4.1993 Basic environmental test procedures for electrical and electronic products-Test Db:

Alternating damp heat test method

GB/T 2423.5-1995 Environmental testing of electrical and electronic products, Part 2: Test method/Test Ea and guidelines: Shock

GB/T 2423.6-1995 Environmental testing of electrical and electronic products, Part 2: Test method/Test Ea and guidelines: Collision

GB/T 2423.8-1995 Environmental testing of electrical and electronic products, Part 2: Test method/Test Ed: Free fall

GB/T 2423.10-1995 Environmental testing of electrical and electronic products, Part 2: Test methods/Test Fc and guidelines: Vibration (sinusoidal)

GB/T 2423.11-1997 Environmental testing for electrical and electronic products, Part 2: Test method/Test Fd: Broadband random vibration-General requirements

GB/T 2423.22-2002 Environmental testing of electrical and electronic products, Part 2: Test N: Temperature change

7. User guide:

1. How to install and fix this product:

1) Before installation, make sure that the product has a good appearance. If it is damaged, deformed, missing accessories, etc., it cannot be used, and it needs to be returned to the original factory for repair;

2) This product must be installed horizontally;

2) The three-in-one is fixed by 4 M8 screws, see the red mark in the figure below:

2. According to the screw size, connection method, etc., use the appropriate torque for installation.

Refer to the following table for details:

The inlet and outlet pipes need to be tightened to avoid water leakage

8. Notice to users:

Please pay attention to the warnings and precautions section before using the product. Improper operation may cause electric shock or damage to the power supply or cause a fire. Please confirm that you have read the warnings and precautions before using the product.

1. Warning:

● When powering on, please keep your hands and face away from the product to avoid accidental injury;

● There are high voltages and high temperatures inside the product, please do not touch the internal components, which may cause electric shock or burns;

- Strictly disassemble the product without authorization for maintenance, debugging and modification;
- During use, if the power supply has abnormal noise or odor, please turn off the input immediately;
- Ensure that the plugs and sockets are tightly connected, loosening may cause local heating and fire;
- Do not charge a battery that has been damaged or cannot be recharged;
- Connectors that meet the specifications must be used;
- Please use the power supply within the range of technical parameters. If it is used outside the range, it may cause damage to the product.

2. Matters needing attention:

- Confirm that the product input/output terminal and signal terminal are connected correctly according to the product manual; when wiring, please cut off the input power supply, and do not plug or unplug the connector when it is live;
- The input/output terminal of this power supply needs to add a fuse type fuse or other overcurrent protection device
- The possible electrical hazards at the output end of the product must be considered to ensure that end product users will not touch the product; terminal equipment manufacturers must design corresponding protection schemes to ensure that engineers or tools will not accidentally touch the power terminals during operation Cause danger
- VAPEL company has the final interpretation right of this product description, without permission, it is not allowed to copy and reprint in any form.

9. packaging, transportation, storage

1. Packaging

The packaging box has the product name, model, manufacturer's logo, the manufacturer's quality department inspection certificate, manufacturing date, etc.; there is a list of accessories in the

packaging box.

2. Transportation

3. It is suitable for transportation by car, ship, and airplane. During transportation, it should be covered, sun protected, and civilized loading and unloading

4. Storage

When the product is not in use, it should be stored in the packing box. The warehouse environment temperature is -10-40℃ and the relative humidity is not more than 80%. No harmful gas, flammable, explosive products and corrosive chemicals are allowed in the warehouse. And there is no strong mechanical vibration, shock and strong magnetic field. The packing box should be at least 20cm away from the ground and at least 50cm away from the wall, heat source, window or air inlet. The storage period under the specified conditions is generally 2 years, more than 2 years. The inspection shall be carried out again after the year.