CHENGDU DACHENG NEW ENERGY TECHNOLOGY CO., LTD.

OBC-DACHENG-Q3-6.6KW

Charger instruction manual

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1.Overview

1.1 Summary

The OBC-DACHENG-Q3 series 6.6KW on-board charger is designed according to national standards and is a product that provides energy replenishment for vehicle power batteries.The charger uses CAN bus control to meet the new national standards CC/CP,electronic lock, and temperature detection interface, and realizes information interaction with the vehicle BMS/VCU, as well as feedback on working status.This product not only has the advantages of high efficiency, small size, high stability, and long life, but also has the characteristics of high protection level, high reliability, and complete protection functions. It is an ideal power supply for charging electric vehicles.The product is equipped with built-in thermal sensing device, which have overheat protection function and can automatically recover.The fully sealed process, with protection grades up to IP66, can ensure that it can work in any complex environment without causing failures.

1.2 Main features of charger

1.2.1 Fan/liquid cooling heat dissipation

1.2.2 Built-in temperature sensor to turn off output under dangerous operating conditions (internal 95 ° C)

1.2.3 Protection level reaches IP66, which can work safely under short-term water immersion conditions

1.2.4 Comply with CAN2.0 communication specification, the bus displays working status, fault codes, etc.

1.2.5 Supports UDS function diagnosis and reporting to the vehicle system. and can also refresh the system offline through a remote refresh program to reduce after-sales maintenance costs.

1.2.6 Compatible with the new national standard CC/CP, electronic lock, temperature detection.

1.2.7 With self-diagnosis, input and output over voltage, under voltage protection, short circuit protection, hardware fault protection, over temperature protection and recovery functions.

1.3 Industry terms

Item	Terminology or abbreviations	Introduction
1	BMS	Battery Management System
2	ADS	Auto-Disconnect System
3	SOC	State of Charge
4	CAN	Controller Area Network
5	ECU	Electronic Control Unit
6	EV	Electric Vehicle
7	OBC	On Board Charger
8	DCDC	DC-DC Converter
9	PDU	Power Distribution Unit
10	HV	High Voltage
11	LV	Low Voltage
12	CC	Constant Current
13	CV	Constant Voltage
14	MCU	Motor Control Unit
15	VCU	Vehicle Control Unit
16	UDS	Unified Diagnostic Services
17	ASIL	Automotive Safety Integrity Level
18	HVIL	High Voltage Interlock Loop

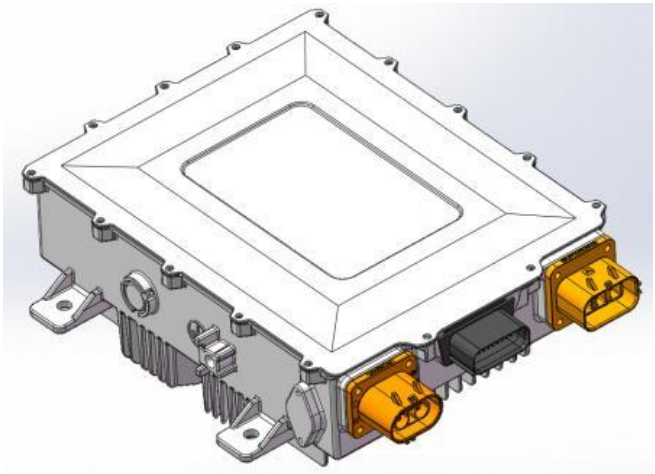
2.Size and appearance

2.1 Size and quality

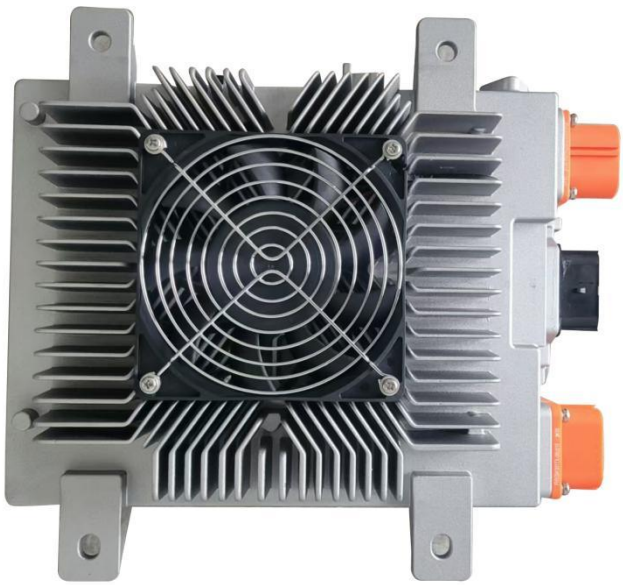
Cooling mode	Length（mm）	Width（mm）	Height（mm）	Weight（KG）
Air cooling	Small hole distance 170±1	Small hole distance 244±1	117±3（Air cooling）	7.5±0.5

2.2 Appearance

The surface of this charger is smooth, without any defects such as peeling, rust, cracks, spots, burrs, deformation and hand-accessible concave and convex phenomenon. The connectors are complete, and the parts are securely fastened, without any defects or damage such as rust, burrs, and cracks. The Plug in sheaths and pins are intact and undamaged, and all parts are securely connected.



Air cooled product appearance（Small hole distance/Huzheng connector）



3.Charger technical indicator

3.1 Environmental requirement

▲Operating ambient temperature

District	Minimum temperature	Maximum temperature
Global	-30℃	55℃（Internal temperature 85℃）

▲Storage ambient temperature

District	Minimum temperature	Maximum temperature
Global	-30℃	85℃

▲ Humidity: Relative humidity 5%~95%, no condensation

▲ Altitude: Altitude ≤2000m, meet GB/T 40432-2021 standard

▲ Work noise: The maximum noise during operation ≤ 65dB, which meets the GB/T 40432-2021 standard

3.2 Charger regulatory requirements and reference standards

Item	Standard number	Standard name	Remark
1	GB/T 40432-2021	Conductive on-board charger for electric vehicles	/
2	GB/T 18488.1-2015	Electric motors and their controllers for electric vehicles - Part 1: technical conditions	/
3	GB/T 18384.2-2015	Safety requirements for electric vehicles - Part 2: Functional safety and fault protection	/
4	GB/T 18384.3-2015	Safety requirements for electric vehicles - Part 3: Protection against electric shock for personnel	/
5	GB/T 18387-2008	Limits and methods of measurement for electromagnetic emission intensity of electric vehicles	/
6	GB/T 31498-2015	Post-crash safety requirements for electric vehicles	/
7	GB 9254-2008	Limits and measurement methods for radio disturbance of information technology equipment	/

8	GB/T 18655-2010	Vehicle boat and internal combustion engine radio disturbance characteristics Limits and measurement methods used to protect on-board receivers	/
9	GB 29743-2013	Motor vehicle engine coolant	/
10	GB 4208	Enclosure protection Class (IP code)	/
11	GB/T 28046-2	Environmental condition and test for electrical and electronic equipment for road vehicles - Part 2: Electrical load	/
12	GB/T 28046-3	Environmental condition and test for electrical and electronic equipment for road vehicles - Part 3: Mechanical load	/
13	GB/T 28046-4	Environmental condition and test for electrical and electronic equipment for road vehicles - Part 4: Climate load	/
14	GB/T 2423.34-2012	Environmental tests-Part 2: Test methods Test Z/AD: Temperature/humidity combination cycle test	/
15	GB/T 2423.1-2008	Environmental testing for electrical and electronic products- Part 1: Test method - Test B: Low temperature	/
16	GB/T 2423.2-2008	Environmental testing of electrical and electronic products - Part 2: Test method - Test B: High temperature	/
17	GB/T 2423.3-2008	Environmental testing of electrical and electronic products - Part 2: Test method Cab: constant humid heat test	/
18	GB/T 2423.17-2008	Environmental testing for electrical and electronic products - Part 2: Test method - Test Ka: salt spray	/
19	GB/T 30512-2014	Requirements for prohibited substances in automobiles	/
20	QC/T 413	Basic technical conditions of automotive electrical equipment	/
21	GB/T 2423.17-2008	Environmental testing for electrical and electronic products - Part 2: Test method - Test Ka: salt spray	/
22	GB/T 19596-2017	Electric vehicle terminology	/
23	GB/T 191—2008	Packaging, storage and transportation logo	/
24	GB/Z 17625.6-2003	Electromagnetic compatibility limit value, limits on harmonic current generated by equipment with rated current greater than 16A in low-voltage power supply system	/
25	GB 17625.1—2012	Electromagnetic compatibility limit, harmonic current emission limit (equipment input current per phase ≤ 16A)	/
26	GB/T 18384.3-2015	Electric ehicle safety requirements Part 3: Personnel Electric Shock Protection	/
27	GB/T 19515-2015	Calculation method of reusability and recycling rate of road vehicles	/
28	GB/T 28382-2012	Technical conditions for pure electric passenger vehicles	
29	GB/T 28046.3-2011	Environmental condition and test for electrical and electronic equipment for road vehicles - Part 3: Mechanical load	

4.Charger safety regulation

Item		Condition	Standard
Ground resistance	AC ground wire-ground resistance	The resistance between the ground point and the radiator is less than 100 mΩ, and the test current is 25A AC	≤100mΩ
Input insulation test	Input-shell	Test voltage 1000VDC	≥20MΩ
Output insulation test	Output-shell	Test voltage 1000VDC	≥20MΩ
Antielectric strength	input-output	@2000V/AC 1min	Leakage current≤10mA
	Input-shell	@2000V/AC 1min	Leakage current≤10mA
	Output-shell	@2000V/AC 1min	Leakage current≤10mA

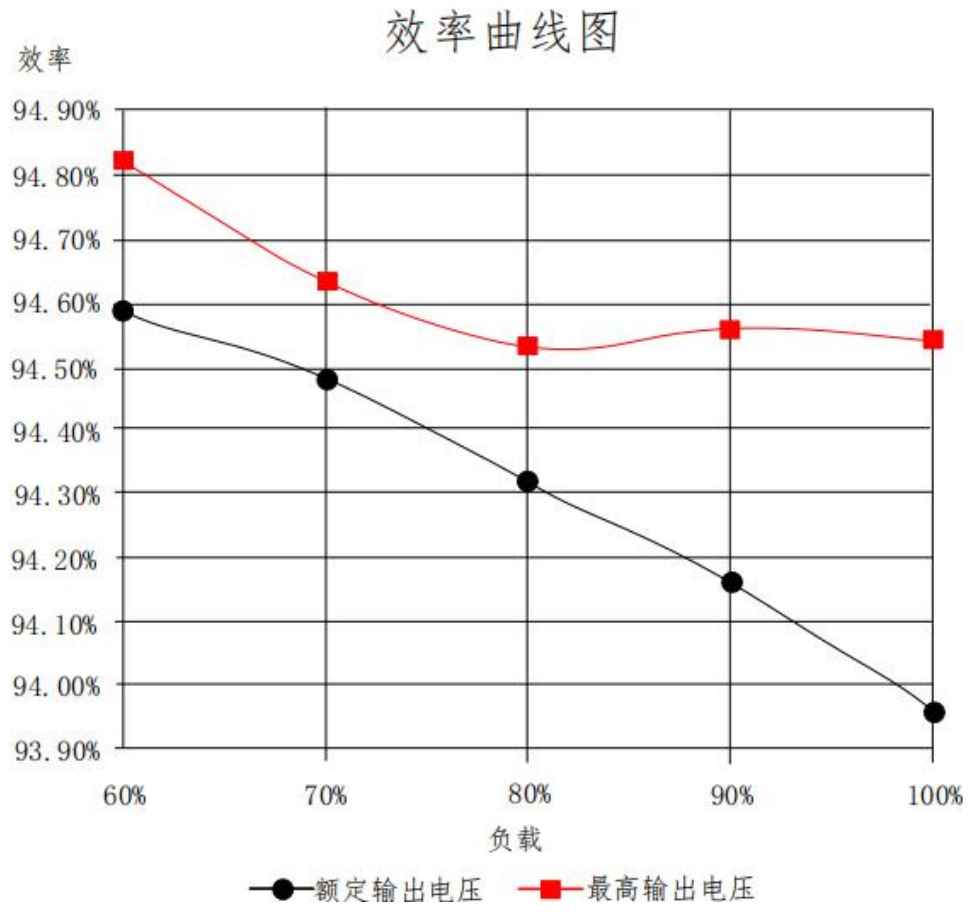
5.Electrical performance of charger

5.1 Electrical characteristic

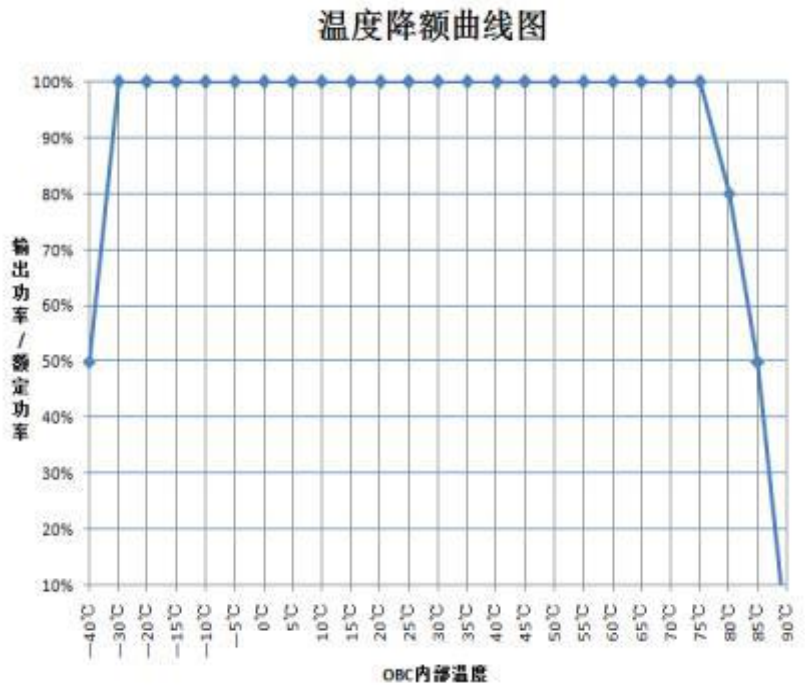
Input electrical characteristic							
Rated input voltage	220V AC						
Input voltage range	90-265V AC						
Frequency	45-65Hz						
Maximum input current	32A						
Power factor	≥0.99 More than half load						
Standby power consumption	≤5W						
Output electrical characteristic							
Rated output voltage	48V	80V	96V/108V	144V	360V	540V	720V
Output voltage range	30V-80V	50V-105V	65V-140V	90V-195V	220V-450V	350V-650V	550V-850V
Output current range	0-80A	0-80A	0-60A	0-44A	0-18A	0-12A	0-9A
Rated output power	6.6KW（220VAC） 3.3KW(110VAC)						
Output mode	Constant voltage/constant current						
Output constant pressure accuracy	1%						
Output constant current accuracy	±0.5A（Io≤10A）&≤±5%（Io>10A）						
Output response time	≤200mS						
Voltage ripple coefficient	1%						
Overall efficiency	≥92%				≥94%		
Protection function							
Input over voltage protection value	AC 270±5V						
Input under voltage	AC 85±5V						

protection value	
Output over voltage protection value	When the maximum output voltage exceeds +2%, the output stop.
Output under voltage protection value	When the output voltage is lower than -5%, the output stop.
Output over current protection value	When the output current is greater than the maximum current, the output stops.
Output reverse connection and short circuit protection	Output short circuit, reverse connection protection shutdown, and will automatically recover after the fault is cleared.
CAN communication protection	Automatically stop output when CAN communication fail
Over temperature protection	When the heat sink temperature is higher than 75℃, the output power is reduced. When the temperature is higher than 90℃, the circuit is disconnected and the output is restored when the temperature returns to below 85℃.

5.2 Charger output efficiency and temperature derating curve



Charger efficiency curve



Charger temperature derating curve

5.3 Environmental testing

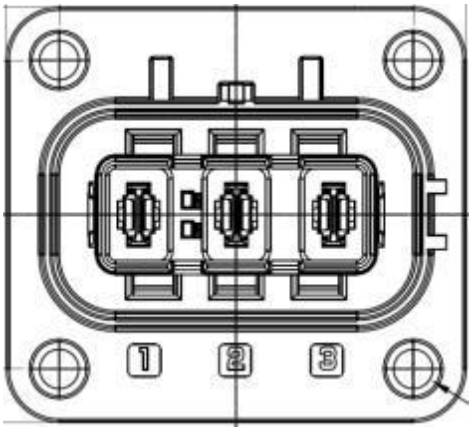
Wet heat test	Meet the requirements of 5.6 in GB/T 28046.4-2011
Low temperature test	Meet the requirements of 5.7.1.1 in GB/T 40432-2021
High temperature test	Meet the requirements of 5.7.1.4 in GB/T 40432-2021
Salt spray test	Meet the requirements of 5.5 in GB/T 28046.4-2011
Electromagnetic immunity	Meet the requirements of 4.5.2 in GB/T 40432-2021
Electromagnetic disturbance	Meet the requirements of 4.5.3 in GB/T 40432-2021
Protection level	IP66
Vibration resistance	Meet the requirements of 4.1 in GB/T 28046.3-2011
MTBF	150000H

6. Interface and definition

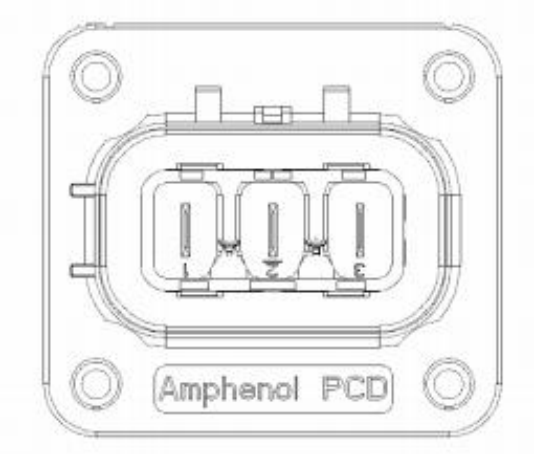
The charger interface mainly includes low-voltage interface and high-voltage interface. The low-voltage signal interface is mainly connected to the vehicle and BMS, and the high-voltage interface is connected to the charging socket and battery pack.

***The low-voltage signal interface connector model is fixed and cannot be replaced, and the high-voltage interface connector model and brand can be selected by the automobile manufacturer.

6.1 AC input interface and definition



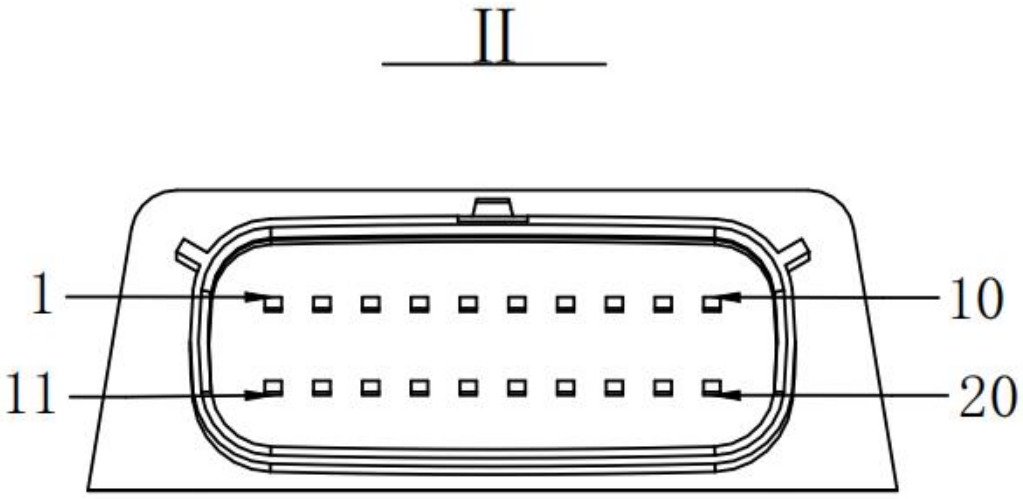
Huzheng connector



Amphenol connect

Product end connector model：FHV201301TX-06U01F HVSL633023A（Amphenol）		Plug end：FHV601301TX-06U01FHVSL633063A1（Ampheno）	
Brand	Pin	Definition	Wire color and diameter
Huzheng/Amphenol	1	L	Brown/6
	2	PE	Yellow green/6
	3	N	Blue/6
	A/B	Interlock	/

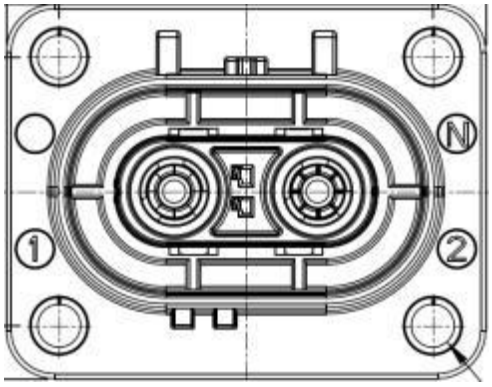
6.2 Signal interface and definition



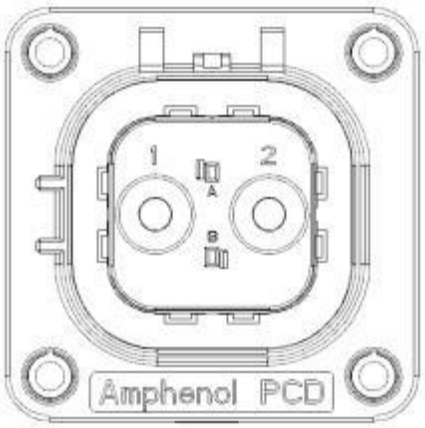
Product end connector model：348302001		Plug end： 334722006		Remark
Brand	Pin	Definition	Function	Designated opening
Molex	1	AC L-line temperature detection	Temperature detection	Designated opening
	2	AC L-line temperature detection	Temperature detection	Designated opening
Molex	3	AC L-line temperature detection	Temperature detection	Designated opening
	4	AC N-line temperature detection	Temperature detection	Designated opening
	5	CC signal	Detect charging gun connection statu	Designated opening
	6	CP signal	Detect the maximum allowable charging current and the grounding reliability between charging pile	Designated opening
	7	KL30	Normal power input positive	Designated opening
	8	Electronic lock power positive		Designated opening
	9	OBC Output wake-up（0.2A）		Designated opening
	10	12V+ Output	Normal power output positive 12V+	2A
	11	CAN_H		
	12	CAN_L		

	13	High voltage interlock	Output to vehicle inspection	Designated opening
	14	High voltage interlock		
	15	Electronic lock feedback 2		Designated opening
	16	Electronic lock feedback 1	Normal output negative electrode	Designated opening
	17	KL31（12v-）		
	18	Electronic lock power negative		Designated opening
	19	CCOUT Signal output		Designated opening
	20	DCDC Enable	Two-in-one reserved space	Designated opening

6.3 DC output interface and definition



Huzheng connector

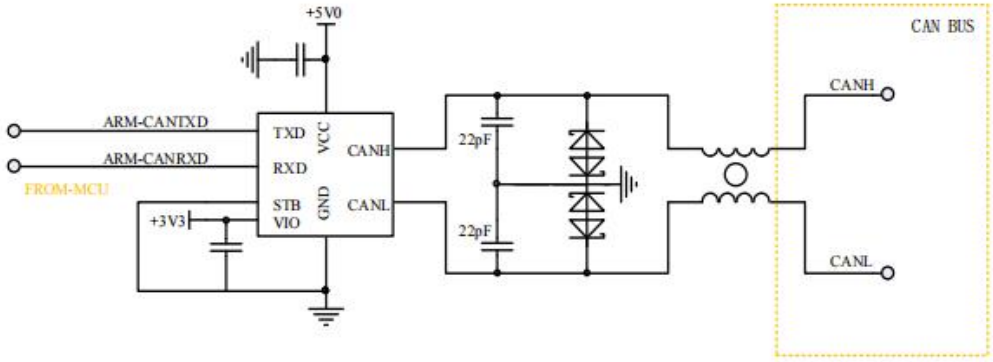


Amphenol connector

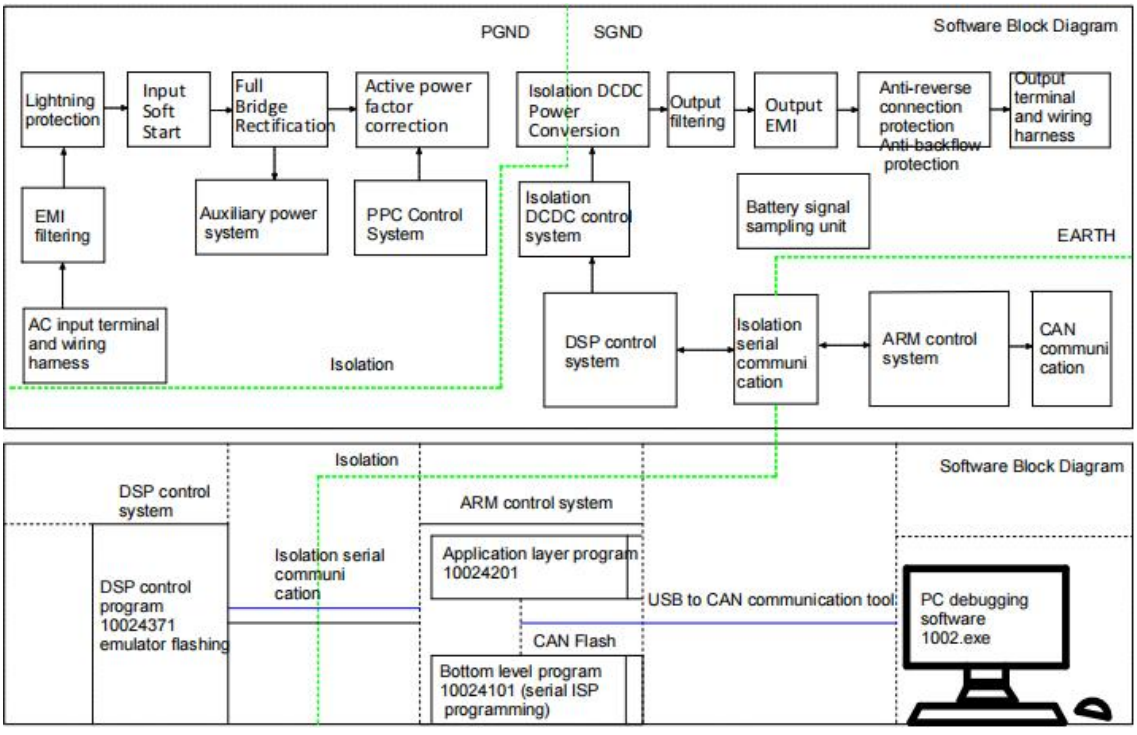
Product end connector model： FHV201236CN-16U01F (16 square) FHV201236TN-10U01F (10 square) FHV201236TN-04U01F (2.5-4 square) HVSL362022A (Amphenol)		Product end connector model: FHV601236CN-16U01F (16 square) FHV601236TN-10U01F (10 square) FHV601236TN-04U01F (2.5-4 square) HVSL362062A110I (Amphenol)	
Brand	Pin	Definition	Cable color and diameter
Huzheng/Amphenol	1	Positive electrode	Red /2.5-16mm² (optional according to current size)
	2	Negative electrode	Black /2.5-16mm² (optional according to current size)
	3/4	Interlock	/

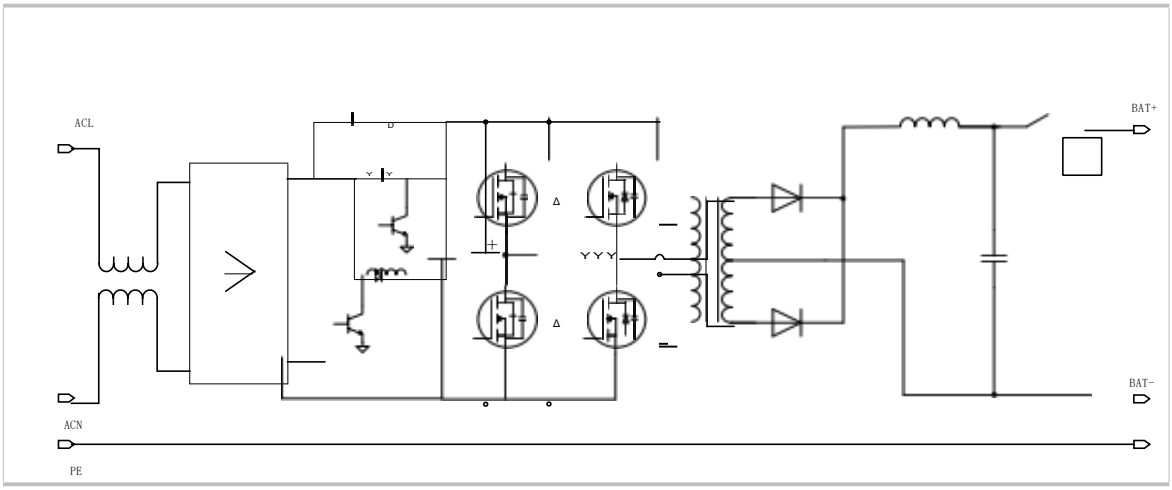
7. Schematic block diagram

7.1 CAN Block diagram of communication isolation principle（Without terminal resistor）

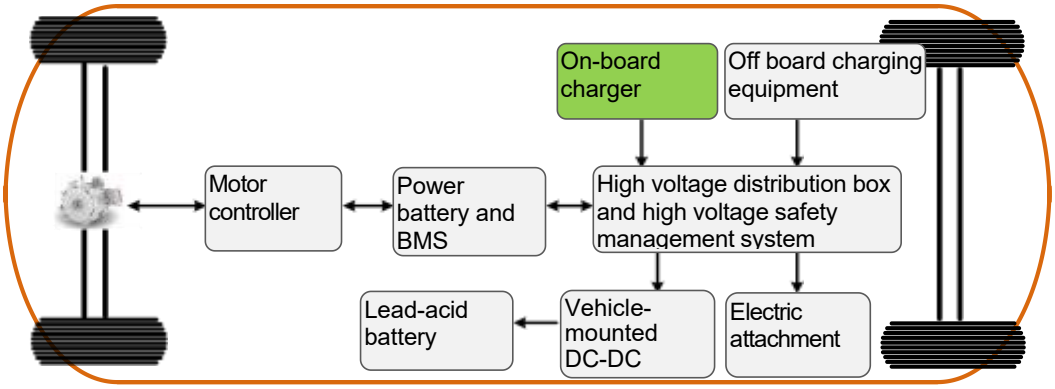


7.2 Hardware schematic diagram





7.3 Vehicle connection block diagram



8. Nameplate, warning mark, packaging, transportation, storage

8.1 Nameplate and bar code (nameplate labels are traceable)

The basic parameters of the nameplate include: model, rated voltage, rated power, production date, serial number, etc. The following format is for reference:

Product Name：Fully enclosed variable frequency charger
Product Model：OBC-DACHENG-Q3-6.6KW
input parameter：90-250VAC 50/60Hz
Specification parameters：XXXVXA CAN3.0
Battery model：XX battery（XXS）
OBC output：V/C: XXXV-XXA
CE FCC RoHS
OBC=DACHENG-20241016XXXXX-1T

8.2 Warning sign

High voltage warning sign

8.3 Package

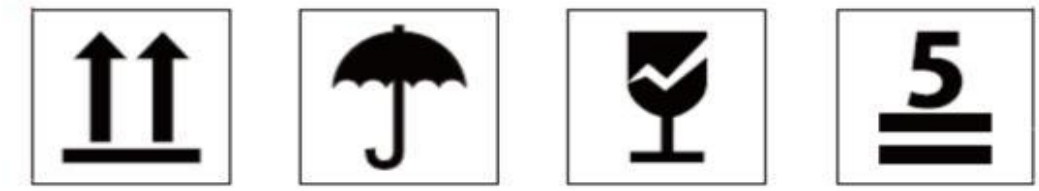
On the packing box are the product name, model, manufacturer's logo, inspection certificate of the manufacturer's quality department, date of manufacture, etc.

The packing box contains a list of accessories:

Item	Name	Quantity	Unit	Remarks
1	Charger assembly	1	unit	
2	Test Report	1	piece	One copy per batch

8.4 Transport

The product is transported in sturdy packaging boxes that comply with relevant national standards and have signs such as "Handle with Care" and "Moisture proof" on the outside. The packaging box containing the product is allowed to be transported by various means of transportation. During transportation, direct rain, snow, and mechanical impact should be avoided.



8.5 Storage

The product should be stored in the packaging box when not in use, the ambient temperature of the warehouse is -10-40 ℃ and the relative humidity is not more than 80%, harmful gases, flammable, explosive products and corrosive chemicals are not allowed in the warehouse, and there is no strong mechanical vibration, impact and strong magnetic field, the packing box should be padded at least 20cm high from the ground. At least 50cm away from the wall, heat source, window or air inlet, the storage period under these conditions is generally 2 years, and re inspection should be conducted after exceeding 2 years.

The product should be stored in a well ventilated and dry place. At the same time, it is necessary to avoid high temperature sources, fire sources and chemicals. Store neatly and avoid throwing or smashing.

9. Safety guide

Warning: remind users of the danger of operating with electricity

* It is strictly forbidden to disassemble and modify the device for repair or debugging without authorization.
* Do not place the parts in a location exposed to rain.
* Before installation, ensure that the shell is intact. If it is damaged, replace it immediately or contact the after-sales service.
* All plugs and sockets should be securely connected. Replace them immediately if they are damaged or loose.
* It is strictly prohibited to plug and unplug connectors while the product is powered on, otherwise it may cause personal injury.
* It is strictly prohibited to open the product casing while the product is powered on, otherwise it may cause personal injury.
* It is strictly forbidden to touch the high-voltage live parts of the product with bare hands. Please wear insulating gloves, insulating shoes, and insulating clothes when inspecting and repairing. It is strictly forbidden to repair and inspect with live power.

* During the process of replacing fuses and contactors, rough operation is strictly prohibited to avoid damaging the product and causing safety hazards.
* When the battery is charging normally, please keep away from fire and flammable and explosive items.
* Never charge a damaged or non-rechargeable battery.

Note: Remind users that the following operations are important operations for this product.

* Do not block the air inlet and outlet of the product to prevent overheating.
* Please confirm that the output cable is not too long to avoid the impact of line voltage drop on charging.
* When moving this product, disconnect the power cord and charging plug.
* The battery pack voltage must match the nominal voltage of the charger.
* Avoid collision, compression, and do not pull, twist, or shake the charging cable.
* The product should be placed in a safe, ventilated, dust-free, and rainless . environment.