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6.6KW OBC Liquid

Model No. ATC6K6-60012-LW

Technical Specification

Version：V1.0

Issue Date：2021.1

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Version	Update	Edit	Audit	Approval	Date
V1.0	Draft	Tianxiang Pan	Lizhen Tang	Hongbin Zhang	2021.1.1

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1. Overview

1.1 Subject

HK-LW full-sealed on-board OBC is a product specially designed for new energy vehicle by Tiecheng Information Technology Co., Ltd according to China standard QC/T895-2011 Conductive On-board Charger for Electric Vehicle, which function is as the battery charger of new energy vehicle This product not only have the advantages of high efficiency, small size, high stability, long-lifetime but also have the performance of high protection level, high reliability, more protection functions, it is a ideal power supply solution for electrical vehicle. Thermal sensor is built-in the charger, has the function of over-temperature and can auto-recovery when temperature decreased. With the process of full-sealing, achieve the protection level of IP67, which make sure the excellent working under the complicated operation condition.

1.2 Main Features

1.2.1 Support UDS diagnosis, with CAN wake-up function

1.2.2 Full-sealed process, can reliably work in the temperature of -40℃~60℃

1.2.3 Built-in thermal sensor, shut off when temperature up to 90℃

1.2.4 Protection level with IP67

2. Charger Technical Specification

2.1 Environmental Specification

▲Working environmental temperature

Area	Lowest Temperature	Highest Temperature
Global	-40℃	60℃

▲Storage environmental temperature

Area	Lowest Temperature	Highest Temperature
Global	-40℃	105℃

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

▲Altitude：≤3000m

▲Working noisy：max when working ≤65dB，meet China standard QTC 895-2011

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2.2 Charger regulatory requirements and reference standards

The design and manufacture of this product must meet the related requirements of vehicle which applicable regulations and standards in China, reference standards as following:

No.	Standard Code	Standard Name	Remark
1	QC/T 895-2011	Conductive on-board charger of electrical vehicle	/
2	GB/T 30512-2014	Prohibited substances requirement	/
3	GB/T 18387-2008	Limits and measurement methods for electromagnetic field emission intensity of electric vehicles, broadband, 9kHz~30MHz	/
4	GB/T 18384-2015	Safety requirements of electrical vehicle	/
5	GB/T 18487-2015	Electric vehicle conductive charging system	/
6	GB/T 28382-2012	Technical specifications for all-electric passenger vehicles	/
7	GB/T 14023-2011	Limits and methods of measurement for radio disturbance characteristics of vehicles, ships and installations driven by internal combustion engines	/
23	GB/T 18655-2018	EMC technical requirements for electronic components and subsystems of passenger vehicles	/
24	GB/T 18655-2010	Limits and measurement methods for the radio disturbance characteristics of vehicles, ships and internal combustion engines used to protect vehicle-mounted receivers	/

3. Charger Safety Regulations Specification

	Condition	Requirement
Grounding resistance test	@25A/AC	≤100mΩ
Input insulation test	@1000V/DC	≥20MΩ
Output insulation test	@1000V/DC	≥20MΩ
Input withstand test	@2000V/AC 1min	Leak current≤15ma
Output withstand test	@2000V/AC 1min	Leak current≤10ma
Input to Output withstand test	@2000V/AC 1min	Leak current≤10ma

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4. Charger Electrical Performance

4.1 Input

Input	Input voltage range	AC 90~265V
	Frequency	47~63Hz
	Input Current	≤32A
	Power Factor	≥0.98 @ ≥1650W
	Efficiency	≥93% full loading
	Stand-by power consumption	≤5W
	Starting inrush current	≤48A

4.2 Output

Nominal Voltage Platform		/	/	600V
Output	Output voltage range	/	/	400V-800V
	Max output current	/	/	12A
	Output power	6600W@220VAC；3300W@110VAC		
	Output way	CV/CC		
	Efficiency	≥94%		
	CV accuracy	±1%		
	CC accuracy	±2%		
	Ripple voltage coefficient	±5%		
	Output voltage rising time	＜5S，overshoot＜10%		
	Shut off response time	Current decreased below 10% in 300ms, and decreased to 0A in 500ms		

4.3 Low Voltage Output

Low voltage Output	Output way	CV
	Output voltage	12V
	Nominal current	0.2A
	CV accuracy	±3%
	Output Power	≤66W
	Ripple voltage coefficient	≤1%

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4.4 Control Interface

	12V wake-up input	≤10mA
	12V wake-up signal output	Max 0.2A
	12V CV	Sleep current≤1mA，peak current≤5A
	CAN Communication	yes
	Baud rate	Optional for 125Kbps、250Kbps、500Kbps
	Terminal resistance	Not available

4.5 Other

EMI	Meet GB/T 18487.3-2001 11.3.1 and GB/T 18655-2018
EMD	Meet GB/T 18487.3-2001 11.3.2 and GB/T 18655-2018
Harmonic current	Meet GB 17625.1-2003 6.7.1.1
Protection level	IP67
Vibration resistance	10~25Hz swing 1.2mm，25－500Hz 30m/S^2，8hours each direction
Noisy	≤65dB （Class A）
MTBF	150000H

5. Charger Protection Functions

Protection unctions	Input over-voltage protection	AC270±5V
	Input low-voltage protection	AC85±5V
	Output over-voltage protection	Stop output when exceed the highest voltage ±5V
	Output low-voltage protection	Stop output when below the lowest voltage ±5V
	Over-temperature protection	Power start to decrease when internal temperature rise to 90℃, shut off when rise to 95℃
	Output short circuit protection	Stop output
	Output polarity reverse protection	yes
	Grounding protection	≤100mΩ
	CAN Communication protection	Automatically stop output when CAN communication fails
	Power-off protection	Yes

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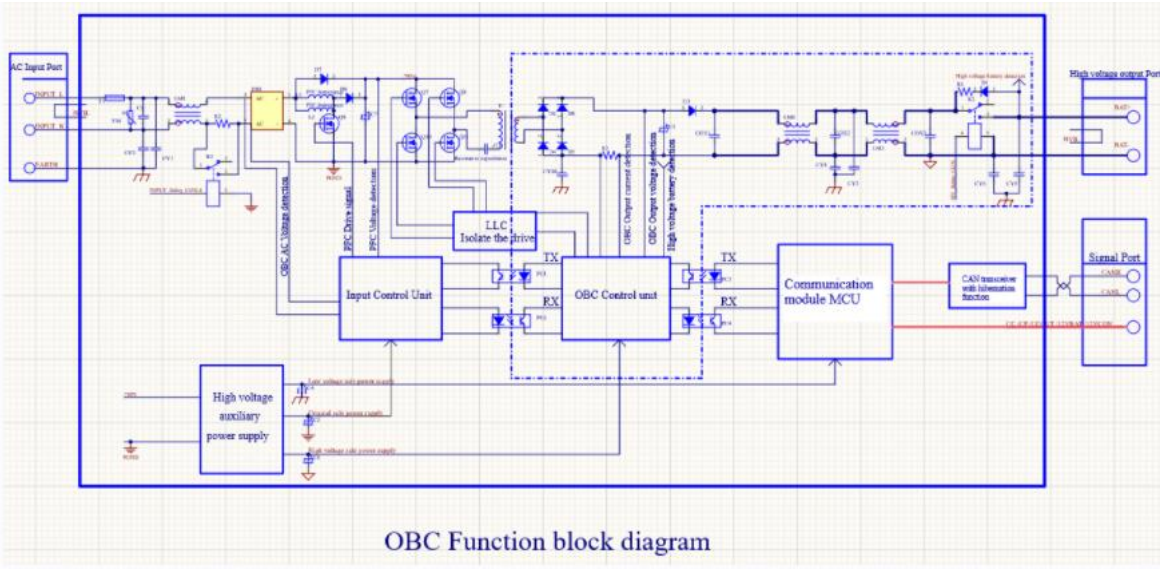
6. Function diagram

6.1 Function block diagram



OBC Function block diagram

7. Control Interface

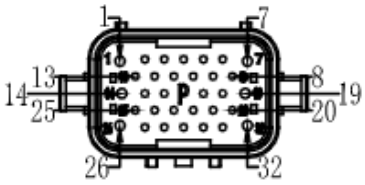
The interfaces in the charger can be grouped into two categories, one category is low voltage interface, the other is high voltage interface.

Low voltage interface includes control connector

High voltage interface includes AC220V input, DC output and HIVL

Connectors can be appointed by customer if quantity order is more than 5000pcs.

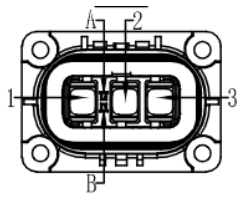
7.1 Low Voltage Connector and Pins Definition



Brand	Pin	Definition	**Note**
Amphenol	1	KL30	
	/	/	
	16	CAN-H	
	17	CAN-L	
	/	/	
	25	12V0.2A	
	32	GND	
	Others	NA	
Socket	HC08B-P32R		
Plug	HC18B-S32		

7.2 High Voltage Connectors and Pins Definition

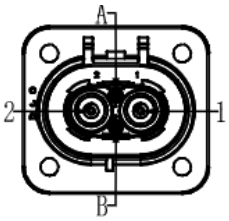
7.2.1 AC Input



Brand	Pin	Definition
RUIKEDA	1	火线（L）
	2	地线（PE）
	3	零线（N）

	A\B	HVIL
Socket P/N：	REM-Z3PCH-6-A	
Plug P/N:	REM-T3PCH-6-A	

7.2.2 OBC Output



Brand	Pin	Definition
AMPHENOL	1	Negative
	2	Positive
	A、B	HVIL
Socket P/N:	C10-763619-2AP2	
Plug P/N:	C10-763621-2AS2	

8. Software requirements

8.1 CAN communication

No.	Items	Technical indicators	Notes
1	Baud rate	250Kbit/s OR 500 Kbit/s	/
2	CAN bus communication protocol	Comply with CAN2.0B specification	/
3	Terminating resistor	No terminating resistor	/

9. Mechanical requirements

9.1 Size and weight

	Length（mm）	Width（mm）	Height（mm）	GW（KG）
Liquid-cooled	331.5±5	265.2±2	79.3±3	≤8.4

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9.2 Appearance

9.3 Appearance requirements

The surface of the part should be smooth, free from defects such as delamination, rust, cracks, spots, burrs, deformation, and hand-accessible bumps. The connecting parts are complete, the parts are securely fastened, and there are no defects and damages such as rust, burrs and cracks. The connector sheath and pins should be intact and free of damage, and the components must be fastened.

10. Installation size