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Version	Change Description	Date(dd/mm/yyyy)
0	First edition	2/6/2020

Item	Charging standard	Product name	Model NO.
1	IEC	2 in 1 2.5kW DCDC+6.6 kW OBC IEC charging Standard	AR2K5D6K6B-270S400L-I

6.6kw 2 in 1 Voltage Range

Items	Mode type	Input Voltage range	Rated input voltage	Output voltage
1	OBC charging mode(Vac)	85~265Vac	220Vac 400Vdc	270~465Vdc
2	DCDC Mode(Vdc)	270~465Vdc	400Vdc	9~16Vdc,rated:14Vdc

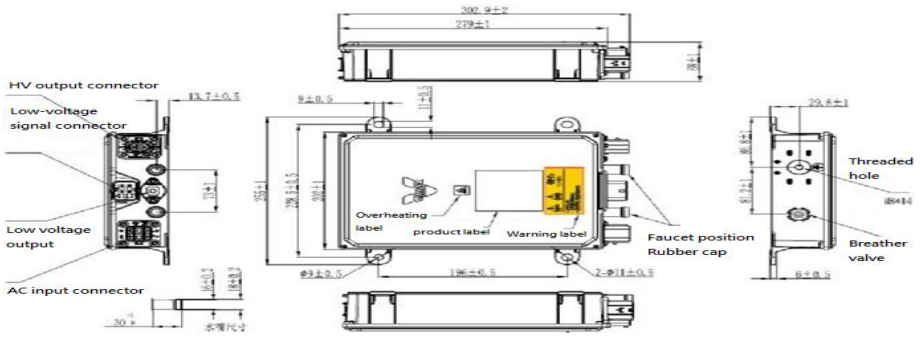
1 Product Overview

1.1 Description

The 2-in-1 product assembly consists of OBC and DCDC. OBC converts AC power to high-voltage DC power to charge the vehicle 's power battery; on-board DCDC converters convert high-voltage DC power to the required low-voltage DC power to power the vehicle 's low-voltage network and charge low-voltage batteries.

1.2 Structural Parameters

Dimensions (mm)	279 x 202 x 68 (Coolant path nozzle, connectors and mounting brackets excluded)
Weight (KG)	5.5



2 Electrical characteristics

2.1 OBC Charging mode：

Specifications	Parameters
AC input	
Input voltage range	85～265Vac
Rated input voltage	220Vac
Input frequency range	45-65Hz
Input Current	32A max
Power Factor	≧0.98@ rated input, output ≧ half load
High voltage output	

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Output voltage range	270V~465Vdc
Rated output voltage	400Vdc
Output current	22 A
Output voltage accuracy	≤±1%
Output current accuracy	≤±3%@＞10A；≤±0.3A @＜10A
Output voltage ripple coefficient	≤±5%
Output Power	6.6 kW max
Efficiency	≧92%@ Rated input and output

2.2 DC/DC mode:

Specifications	Parameters
High voltage input	
Input voltage range	270~465Vdc
Rated input voltage	400Vdc
Input current	12A
Low voltage output	
Output voltage range	9~16Vdc
Output rated voltage	14Vdc
Output current	180A continuous
Output Power	2.5KW continuous
Under Charging / inverting state DCDC output power	2KW max
Efficiency	92%@ Rated input and output
Output voltage accuracy	≤±1%
Output voltage ripple coefficient	≤500mVpp@20MHz
Output voltage overshoot	≤5% Vout

2.3 Low voltage output

Low-voltage input	
Input voltage range	9～16Vdc (Normal work)； 6~18Vdc (Communication is normal)
Quiescent Current	≤2mA (all system)
Communication method	CAN2.0 (The product hardware shares one CAN, no terminal 120Ω resistor)
HVIL function	The high-voltage connector interlock signal is given by the low-voltage signal connector, and its status is detected by the vehicle
Charging wake-up method	Hardwire wakeup, CAN wakeup
DCDC wake-up method	Hardwire wakeup, CAN wakeup
UDS function	Supported
Boot loader function	Supported
AUTOSAR	Support AUTOSAR 4.3.1 network management If necessary, the development cycle is 6 weeks

2.4 Environmental conditions

Specifications	Parameters
Working temperature	-40～+85°C
Ambient storage temperature	-40～+105°C
Working environment humidity	5%~95%, no condensation
cooling method	Liquid cooling
IP Rating	IP67

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2.5 Cooling System

Specifications	Parameters
Coolant Path	nozzle diameter 16mm (outer diameter)
Coolant requirements	50% water and 50% glycol
Coolant temperature	Normal work: -40~+ 65 ℃; Derating work: + 65~+ 85 ℃;
Coolant flow	≥6L/min

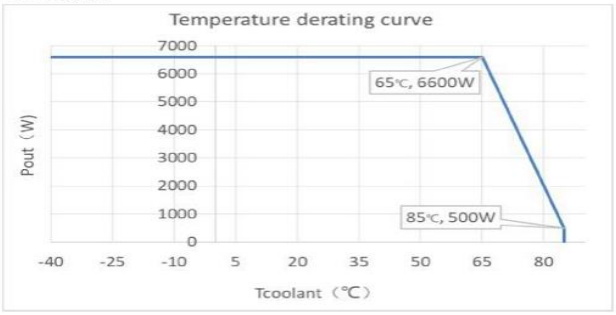
2.6 Safety Features

Specifications	Parameters
Dielectric strength	AC input side to high voltage output side：2800 Vdc AC input side to low voltage output side (housing)：2800 Vdc High voltage output side to low voltage output side (housing)：2800 Vdc
Insulation characteristics	Test voltage 500 Vdc AC input side to high voltage output side：≥10 MΩ AC input side to low voltage output side (housing)：≥10 MΩ High voltage output side to low voltage output side (housing)：≥10 MΩ
Grounding characteristic	Resistance between charger case and PE ＜0.1 Ω

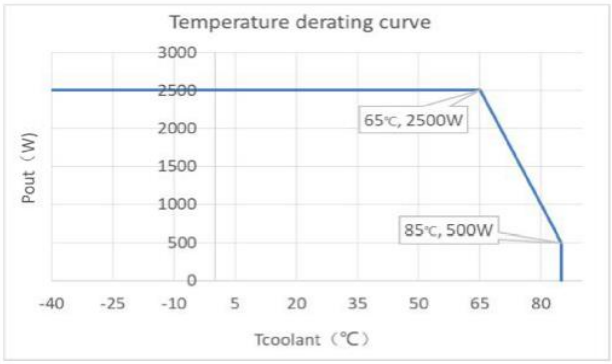
2.7 Temperature derating curve

6.6 kw OBC + 2.5 kw DCDC 温度降额曲线

OBC 降额曲线：

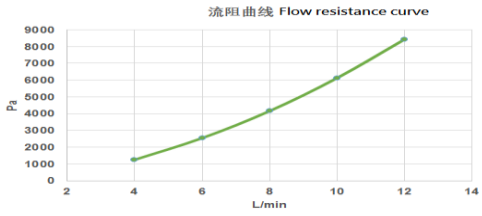


DCDC 降额曲线：



2.8 Thermal Performance Parameters

- 模块满载发热量：422W
  Module full load heat generation: 422W
- 水冷流道流阻曲线：65℃@50%水+50%乙二醇
  Water-cooled flow resistance curve: 65 ℃ @ 50% Water + 50% ethylene glycol
- 水冷换热面积：71800mm²
  Water cooling heat exchange area: 71800mm2
- 换热系数：100.47W/m²·K
  Heat transfer coefficient: 100.47W / m2.K
- 水道容积：0.1L
  Water channel volume: 0.1L
- 最大进口水温≤65℃
  Maximum inlet water temperature ≤ 65 ° C



3 Product interface

3.1 Connector Information

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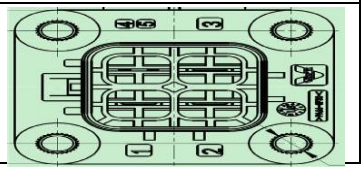
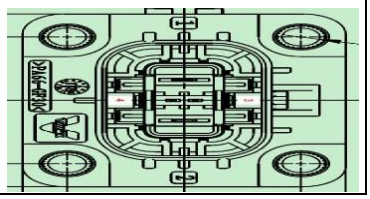
Pinout definition	Receptacle		Plug model	
	Model	Maker	Model	Maker
AC input	YGC1174-EV-P(3+2)R/1	Yonggui	YGC1174-EV-S(3+2)P	Yonggui
High voltage output	YGC1174-EV-P(2+2)RA	Yonggui	YGC1174-EV-S(2+2)PA	Yonggui
Low voltage output	GH01-F200-1NNB-T02	Guoweitong	M8 hole OT terminal	
Low voltage signal	64334-0100	MOLEX	64319-3211	MOLEX

3.2 Connector pin definition (component side)

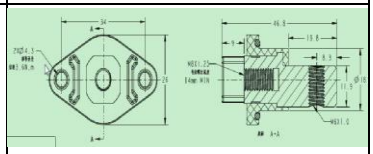
3.2.1 AC input

Position	Description				Picture
1	L1	Fire Wire	Power supply	32A	
2	N	Zero line	Power supply	32A	
3	PE	Ground	Ground	32A	
4	HVIL_in	Interlock_in	signal	20mA	
5	HVIL_out	Interlock_out	signal	20mA	

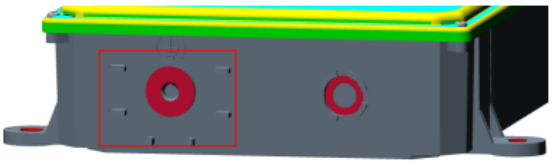
3.2.2 High voltage output

Position	Description				Picture
1	HV+	High voltage output positive	power supply	22A	
2	HV-	High voltage output negative	power supply	22A	
3	HVIL_in	Interlock in	signal	20mA	
4	HVIL_out	Interlock out	signal	20mA	

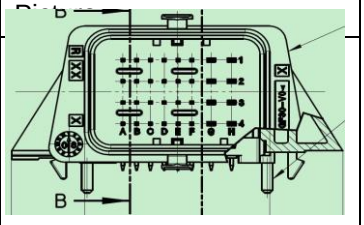
3.2.3 Low-voltage output positive

Position	Description				Picture
/	14V+	Low voltage 14V output positive	power supply	180A	

The low voltage 14V negative pole is directly connected to the housing, and the specific location of the wiring harness lock is shown in the red square below:



3.2.4 Low voltage signal

Position	Description			
1A	NC			
1B	NC			
1C	NC			
1D	NC			
1E	NC			
1F	NC			
1G	NC			

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1H	KL30	Normal power(12V+)	power input
2A	NC		
2B	NC		
2C	NC		
2D	NC		
2E	NC		
2F	NC		
2G	NC		
2H	NC		
3A	NC		
3B	NC		
3C	OBC_Wakeup_in	OBC hard wire wake-up input, continuous high level effective	Analog input
3D	DCDC_Wakeup_in	DCDC hard wire wake-up input, continuous high level effective	Analog input
3E	NC		
3F	NC		
3G	NC		
3H	NC		
4A	CAN_H	CAN high	digital
4B	CAN_L	CAN low	digital
4C	HVIL_in	High-voltage interlock in	Analog output
4D	HVIL_out	High-voltage interlock out	Analog output
4E	NC		
4F	NC		
4G	KL31	Ground (12V-)	Power ground
4H	NC		

Note: The above valid range of medium and high voltage is 6 ~ 18Vdc.