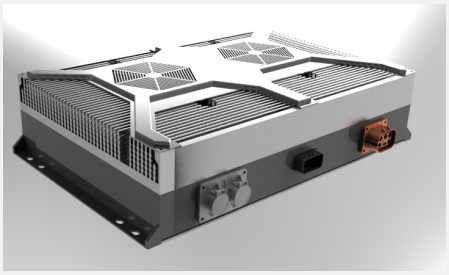
ElCon

Specification list

RA10P0 series on board 10KW

Air cooled charger assembly



1. product brief introduction

RA10P0 series air-cooled vehicle charger is designed for new lithium electric pure electric logistics vehicles, buses, construction machinery and other new energy models research and development of a high power density and high efficiency charger, using modular, standardized, universal design ideas design and development. The charger supports three-phase AC input, and the DC output voltage is adjustable in a full range.

The product adopts full digital control technology design, flexible and intelligent control, good protection characteristics, and strong system robustness. Its own microprocessor communicates with the monitoring unit, and the parameters in the machine CAN be set or adjusted by the upper monitoring unit through the CAN interface.

It has multiple protection functions such as input over-voltage protection, output over-current protection, output over-voltage protection, output short-circuit protection, and over-temperature protection.

main specifications:

Model	inputvoltage	output rating	Rated output voltage	Output current range	CurrentOutput Range
RA10P0024	380VAC	10KW	24VDC	0-40VDC	0-300A
RA10P0048	380VAC	10KW	48VDC	0-68VDC	0-180A
RA10P0072	380VAC	10KW	72VDC	0-95VDC	0-135A
RA10P0108	380VAC	10KW	108VDC	0-135VDC	0-90A
RA10P0144	380VAC	10KW	144VDC	0-180VDC	0-66A
RA10P0360	380VAC	10KW	360VDC	0-500VDC	0-27A
RA10P0540	380VAC	10KW	540VDC	0-720VDC	0-18A

2. Electrical Characteristics

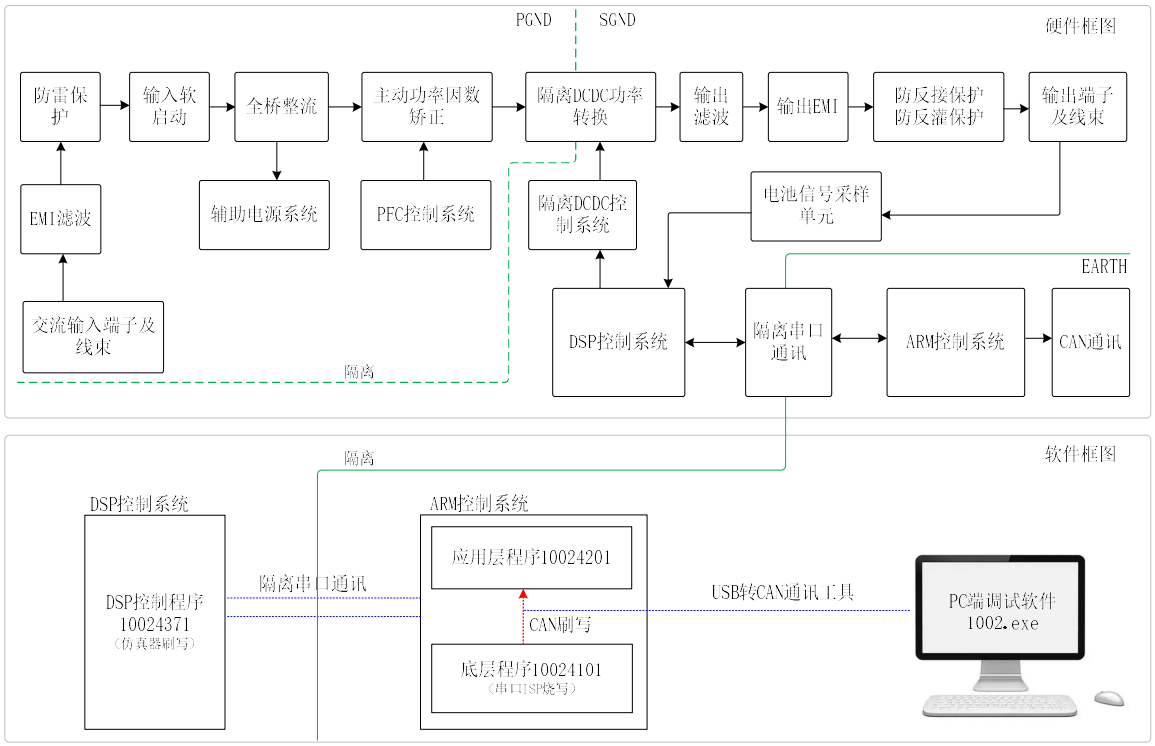
2.1. Electrical Characteristics

model							
Vehicle power Supply type	Air cooled car charger assembly						
Power supply type	24V	48V	72V	108V	144V	360V	540V
input characteristics							
Rated input voltage	380VAC three-phase five-wire system (the middle line must be reliably connected)						

	The output power is 3.3KW when the input is 220V single-phase						
input voltage range	380VAC						
Rated input voltage frequency	50Hz						
Input frequency range	45～65Hz						
inrush starting current	≤45A						
Input power factor	≥0.99（@380Vin,Pomax）						
output characteristics							
output rating	10KW						
Output voltage range V	0-40	0-68	0-95	0-135	0-180	0-500	0-720
Output current range A	0-300	0-180	0-135	0-90	0-66	0-27	0-18
Voltageregulation accuracy	±1%						
precision of steady current	±0.5A（Io≤10A）&≤±5%（Io>10A）						
ripple coefficient of voltage	≤1%						
Output response time	≤200mS						
Typical efficiency	≥91%	≥92%	≥93%	≥93%	≥94%	≥94%	≥94%
protective feature							
Over and under voltage protection	Input over and under voltage shutdown can be self-recovery, output over and under voltage shutdown can be self-recovery.						
Output reverse connection and short circuit protection	Output short circuit, reverse connection shutdown, self-recovery						
over-temperature protection	When the heat sink temperature is higher than 75 ° C, reduce the output power, disconnect the circuit when the temperature is higher than 95 ° C, and restore the output when the charging temperature is lower than 85 ° C						
environmental conditions							
operating ambient temperature	-40 ° C ~ +65 ° C (Automatic derating operation when the ambient temperature is high)						
storage temperature	-40～95℃						
humidity	5%～95%						
IP code	IP67						
Cooling function	forced cooling						
communicating function	CAN-bus control system						
Charging function	Receive charging instructions to charge normally; No command charger is in standby state						
Safety and reliability							
dielectric strength	Primary side - secondary side 2000VAC				Primary side, secondary side - Housing 1500VAC		

insulation resistance	Primary side - secondary side ≥50MΩ
harmonic current	Meet the requirements of 6.7.3.1 in GB17625.1-2003
Vibration resistance	After X,Y,Z three directions of sweep frequency vibration test, parts have no damage, fasteners have no loose phenomenon
Impact resistance	See Requirements 6.5 in GB/T15139-1994
Resistance to industrial solvents	Metal parts have a good corrosion protection layer
Salt spray resistance	See GB/T 2423.17
Durability	Not less than GB/T 24347-2009
EMC characteristics	
Electromagnetic immunity	Meet the requirements of 11.3.1 in GB/T 18487.3
Electromagnetic disturbance	Meets the requirements of 11.3.2 in GB/T 18487.3

2.2. System chart



2.3. Characteristic curve

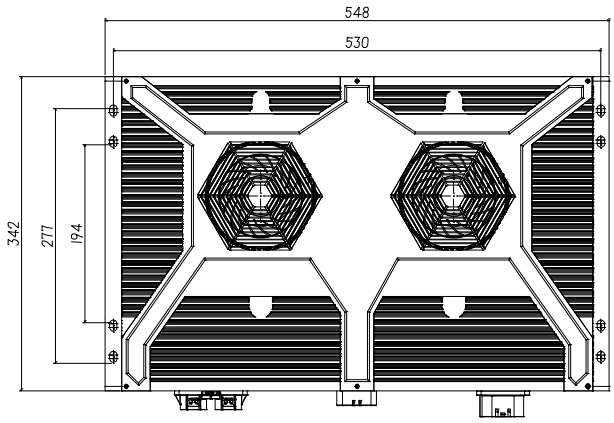
Output characteristic curve TBD
Efficiency curve TBD

3. Dimensions and weight

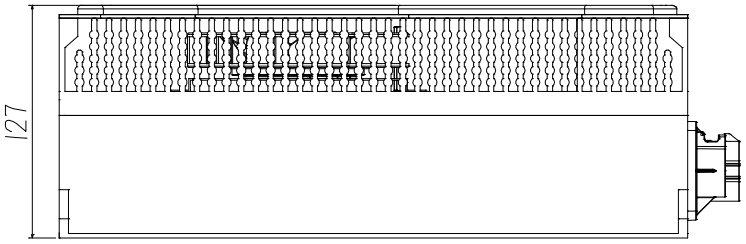
3.1. Product size

3Dmodel data：902.36250000.00.stp

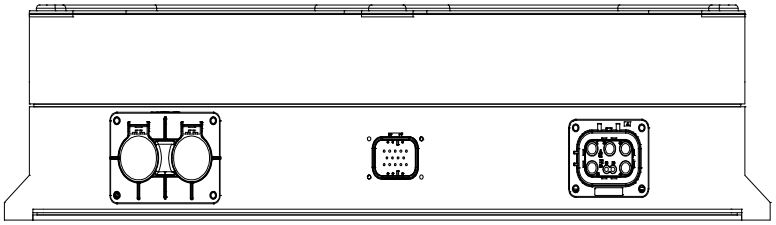
Planform



Right elevation



Axonometric(al) drawing

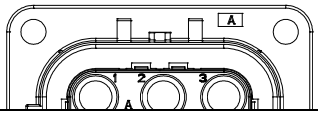


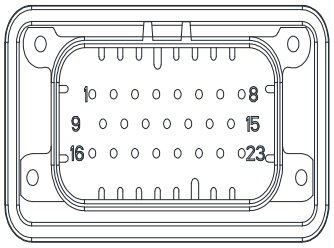
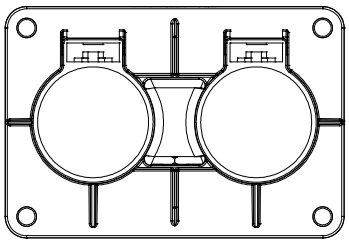
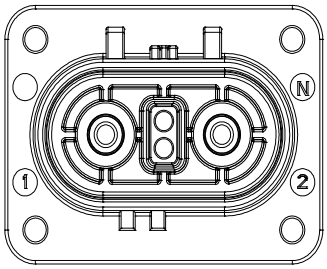
The connector section is for informational purposes only

3.2. Product weight

TBD

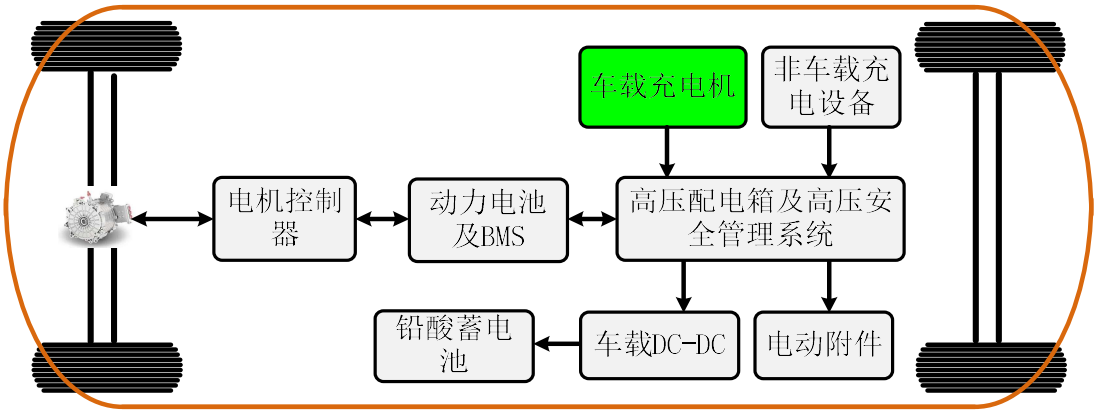
4. Define connectors and connection terminals

serial number	Type	Connector definition		Connector drawing
1	Ac input socket BHL10-E401X-S6	1	L1	
		2	L2	
		3	L3	

		4	N	
		5	PE	
		Plant		Baile
		The cable ends are inserted		BHL18-E40X1-S6
2	Signal socket 1-776228-1	1-19	TBD	
		20	12V+	
		21	12V-	
		22	CAN L	
		23	CAN H	
		Plant		TE
		The cable ends are inserted		Sheath: 770680-1; Terminal: 770520-1
3	output socket1 PRC20-301-10M10 RA10P0024 RA10P0048 RA10P0072	X	Output +	
		Y	Output -	
		Plant		Baile
		Pair		PRC00X-301-10D10/ PRC00Y-301-10D10
4	output socket2 FHV220260CN-UM61J RA10P0108 RA10P0144	1	Output +	
		2	Output -	
		Plant		Shanghai futronics Electronic Technology Co., Ltd
		Pair		FHV600260TN-25U01J

5. User Guide

5.1. Electrical connection diagram



5.2. Product installation

Product type	Air cooled car charger assembly	
Install screw	Mounting hole aperture	TBD
	Numbe	TBD
	Screw model recommendation	TBD

Install and secure the product

Align the mounting holes, lock the screws, and secure the power supply.

Tightening torque requirements

Install with appropriate torque according to screw size, connection mode, etc. Refer to the following table for details:

specifications and models		Tightening torque (torque range: ±10%)/(Unit: Kgf.cm)						
broad heading	subclass	Plastic - Plastic	steel-plastic Copper-Copper	General connection		High-density connection High-density connection		
				Steel-steel	Copper - cast aluminum Steel-aluminum profiles steel-copper	Steel-steel	Steel - Cast aluminum steel-copper	Steel-aluminum profiles
socket head cap screw	M2		0.8	1.5	1.5	2.5	2.5	1.5
	M2.5		1.6	3	3	5.5	4.5	3
	M3	1.5	3	5.5	5	10	8	6
	M4		6	12	10	16	14	12
	M5		10	20	13	30	28	20
	M6		15	30	28	50	48	30
	M8					80	80	-

	M10					100	100	

5.3. CAN communication protocol

Entry	Technical indicators	Reserve injection
Crystal tolerance	± 0.15%	Within the operating temperature range
Traffic rate	通过后台软件可配置 配置后掉电不丢失	Tolerance is ±0.375 Kbit/s
Sampling site	The sampling point should be set near but not later than 7/8 of the bit time	
transceiver	The maximum transceiver "loop delay" (from send to receive) is 300 ns	CAN transceivers shall conform to ISO 11898-2
Terminal resistance	The charger CAN communication circuit has no 120 ohms terminal resistance by default	
CAN communication protocol	TBD	

5.4. Background debugging software description

Product type	Car charger assembly	
Background software coding	3610.exe	
Background software communication method	CANcommunications	Baud rate 125K/250K/500K adjustable
Installation and use help		上位机使用说明.pdf
CAN box support Brand 1	1. Beijing ATai USBCAN-2I 2. Beijing Aitai USBCAN-I	USBCAN Driver for Windows 10-amd64-1.0.1.exe
CAN box support Brand 2	TBD	

5.5. Troubleshooting and confirmation

Fault phenomenon	Common failure causes	Trouble removal
The charger is not powered on	Ac gun has no AC input	Check the input circuit breaker or socket before AC
	The AC connector is not inserted properly	Reinsert the connector
	Charge guidance signal connector is not plugged in	Reinsert the signal connector
The charger has no packet	The signal connector is not connected properly	Reinsert the signal connector

	CAN Wire reversal	Adjust the CAN line sequence
	The communication protocol does not match	Check whether protocols match each other
	The baud rate does not match	Check whether the baud rate matches
No high voltage output	The high voltage output is not connected to the battery	Check the high voltage connectors and cable harnesses
	The charger did not receive the BMS command	View message
	The positive and negative battery terminals are connected in reverse	Check the high voltage connectors and cable harnesses
Overtemperature fault	Air-cooled machine: The fan is blocked or the air duct is blocked	Check fans and air ducts
	Water-cooled machine: no coolant or coolant temperature is too high	Check that the coolant is normal

6. User Notices and precautions

Please note the Warnings and precautions section before using the product. Incorrect operation may cause damage to the power supply or cause a fire. Make sure you have read the warnings and precautions before using the product.

Warning:

注意事项:

The input/output end of the power supply should be supplemented with a blown fuse or other overcurrent protection device;

The possible electrical hazards at the output end of the product must be considered to ensure that the end product user will not come into contact with the product; The manufacturer of the terminal equipment must design the appropriate protection scheme to ensure that the operation will not cause danger due to accidental contact of the engineer or tool with the source terminal;

Once the safety protection of the equipment is damaged, the equipment must stop working and refer to the relevant maintenance regulations.

When the power supply device is switched from a cold environment to a warm environment, condensation may cause leakage hazards, so the grounding requirements must be strictly implemented.

Only a qualified person can connect the equipment to the power supply.

The power supply must be shut down for five minutes, so that the capacitor has sufficient discharge time before the power supply equipment can be maintained.

Pay attention to the use of safety: there are safety warning signs, high pressure signs, avoid hand contact, so as to avoid electric shock, burns.

7. Reference standards and specifications

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

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

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

GB/T 2423.2-2001 Environmental testing of electrical and electronic products-Part 2: Test methods/Test B: High temperature

GB/T 2423.3-1993 Basic environmental test procedures for electrical and electronic products-Test Ca: constant wet heat test method;

GB/T 2423.4.1993 Basic environmental test procedure for electrical and electronic products-Test Db: alternating wet heat test method

GB/T 2423.5-1995 Environmental testing of electrical and electronic products - Part 2: Test methods/test Ea and guidelines: Impact

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

GB/T 2423.8-1995 Environmental testing of electrical and electronic products-Part 2: Test methods/test Ed: free drop

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 of electrical and electronic products-Part 2: Test methods/Test Fd: wide-band random vibration

GB/T 2423.22-2002 Environmental testing for electrical and electronic products-Part 2: Test

N: Temperature change

GB/T 14508-93 Grade Environmental conditions of highway cargo transport machinery

GB/T 18384.3-2001 Safety requirements for electric vehicles - Part 3: Protection against human shock

GB/T 17619 Electromagnetic radiation immunity limits and measurement methods for motor vehicle electronic and electrical components

GB/T 18488.1-2006 Drive motor systems for electric vehicles - Part 1: Technical requirements

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

GB/T 18655-2010 Measurement, ship and internal combustion engine radio disturbance characteristics Limits and measurement methods used to protect on-board receivers

Q/FT B102-2005 Requirements for traceability marking of vehicle product parts

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

GB/T 17626.3-2006 Electromagnetic compatibility testing and measurement techniques Radiofrequency electromagnetic field radiation immunity test

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

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

GB4943-2001 Security of information technology equipment

8. Packaging, transportation and storage

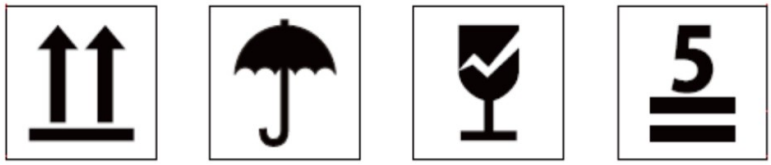
Packaging

Product packaging information is as follows:

Packing quantity and box information	The net weight of one module is Kg	TBD
	The outer dimension of the packing case is mm	TBD
	Number of modules in a box	1
	Total weight after packing Kg	TBD

The name of the product, the model of the product and the name of the manufacturer are shown on the packing box; The technical documents supplied with the products in the packing box shall include the certificate of product delivery.

The product should be firmly packed when transported, and the external use of the box should be in accordance with the relevant national standards and should be marked "handle with care" and "moisture-proof". Containers containing products are allowed to be transported by various means of transport. Direct rain and snow and mechanical impact should be avoided during transportation. Transport marks should be attached, as shown in Figure 7-2 below:



Carriage mark

Keeping

Products should be stored in the packing 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, more than 2 years should be re-tested.

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

9. Version update record

Date	Versions	Reasons for change	Remark
2024/09/10	V1.0	Initial release	