ElCon

Catalog of Specifications

TR3620 series on board three-phase 20KW

Air cooled charger

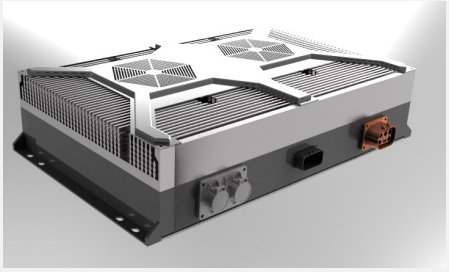


Table of Contents

1 Product Introduction

The TR3620 series air-cooled car charger is a high-power density **and** high-efficiency charger developed specifically for new energy vehicle models **such as** lithium-ion pure electric logistics vehicles, buses, **and** construction machinery**. It is** designed **and** developed using modular, standardized, **and** universal design concepts. The charger supports three-phase AC input and adjustable DC output voltage across the entire range.

The product is designed using fully digital control technology, with flexible and intelligent control, good protection characteristics, and strong system robustness. The built-in microprocessor communicates with the monitoring unit, and the internal parameters can be set or adjusted by the higher-level monitoring unit through the CAN interface.

It has multiple protection functions such as input overvoltage protection, output overcurrent protection, output overvoltage protection, output short circuit protection, and over temperature protection.

Main specifications:

model	Input Voltage	Rated output power	rated output voltage	Output voltage range	Current range
TR3621	**152~456VAC**	**20KW**	**80VDC**	**0-105VDC**	**0-240A**
TR3622	**152~456VAC**	**20KW**	**108VDC**	**0-135VDC**	**0-180A**
TR3623	**152~456VAC**	**20KW**	**144VDC**	**0-180VDC**	**0-132A**
TR3624	**152~456VAC**	**20KW**	**360VDC**	**0-500VDC**	**0-54A**
TR3625	**152~456VAC**	**20KW**	**540VDC**	**0-720VDC**	**0-36A**
TR3626	**152~456VAC**	**20KW**	**700VDC**	**0-850VDC**	**0-24A**

2 Electrical characteristics

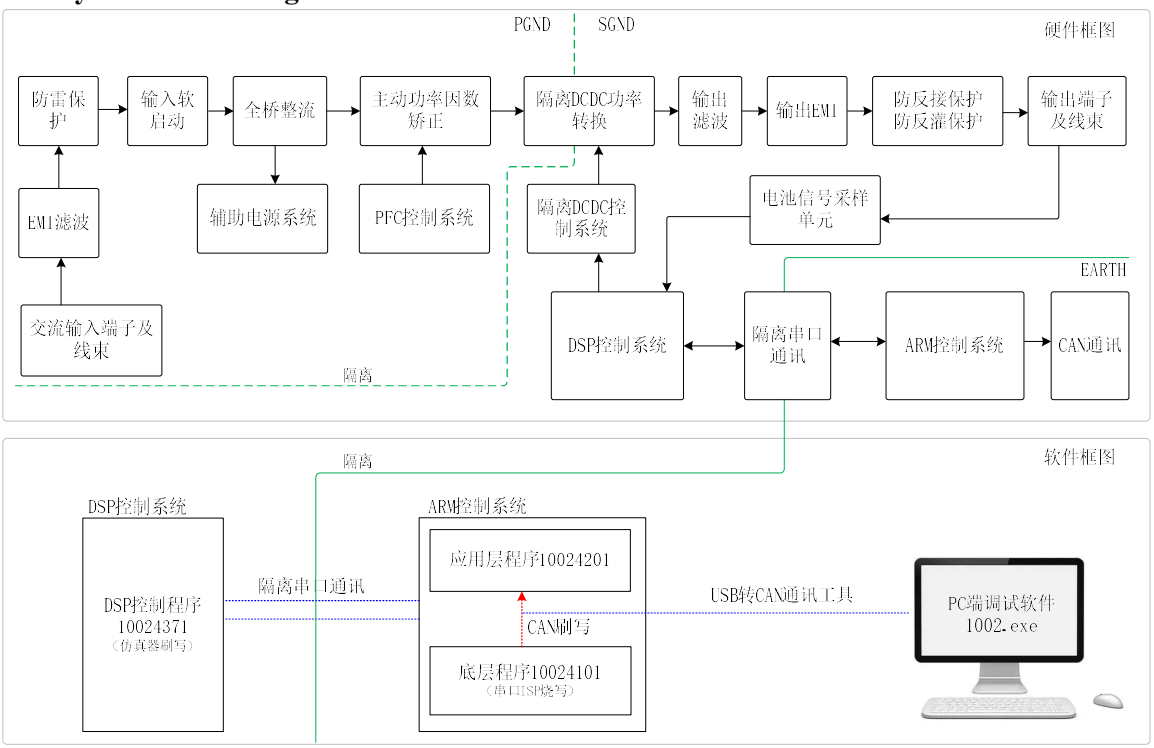
2. 1 Electrical characteristics

model						
Vehicle power supply type	**Air cooled car charger assembly**					
power model	**TR3621**	**TR3622**	**TR3623**	**TR3624**	**TR3625**	**TR3626**
Input characteristics						
Rated input voltage	380VAC three-phase five wire system (the neutral wire must be reliably connected) When inputting 220V single-phase electricity, the output power is 6.6KW					
Input Voltage	152～456VAC					
Rated input voltage frequency	50Hz					
Input frequency range	45～65Hz					

Start the impulse current	**≤32A**					
Input power factor	≥0.99（@380Vin,Pomax）					
output characteristic						
Rated output power	**20KW**					
Output voltage range V	**0-105**	**0-135**	**0-180**	**0-500**	**0～720**	**0-850**
Output current range A	**0-240**	**0-180**	**0-132**	**0-54**	**0～36**	**0-24**
Voltage stabilization accuracy	±1%					
stabilized current precision	±0.5A（Io≤10A）&≤±5%（Io>10A）					
ripple coefficient of voltage	≤1%					
Output response time	≤200mS					
Typical Efficiency	**TBD**	**TBD**	**TBD**	**≥94%**	**≥94%**	**≥94%**
Protection features						
Overvoltage and undervoltage protection	Input overvoltage shutdown can self recover, output overvoltage shutdown can self recover.					
Output reverse connection and short circuit protection	Shutdown in case of output short circuit or reverse connection, self recovering					
Over Temperature Protection	When the temperature of the heat sink is higher than 75 ℃, reduce the output power. When the temperature is higher than 95 ℃, disconnect the circuit. When the charging temperature returns to below 85 ℃, the charger will resume output					
environmental condition						
Ambient Temperature	**-40 ℃~+65 ℃ (automatic derating operation will occur when the ambient temperature is high)**					
storage temperature	**-40～95℃**					
humidity	**5%～95%**					
IP GRADE	IP67					
Cooling function	**Forced air cooling**					
communication	CAN bus control					
charging function	Receiving charging instructions can charge normally; The no command charger is in standby mode					
Safety regulations and reliability						
dielectric strength	**Primary side - secondary side 2000VAC**			**Primary and secondary sides - chassis 1500VAC**		
insulation resistance	Primary side - secondary side ≥ 50M Ω					
harmonic current	Complies with the requirements of 6.7.3.1 in GB17625.1-2003					
Vibration resistance performance	After conducting frequency sweep vibration tests in X, Y, and Z directions, there was no damage to the components and no loosening of the fasteners					
impact resistance	Refer to the requirements of 6.5 in GB/T15139-1994					
Resistance to industrial solvents	Metal components have a good anti-corrosion layer					
Salt spray resistance	Refer to GB/T 2423.17					

performance	
durability	Not lower than the relevant provisions of GB/T 24347-2009
EMC characteristics	
electromagnetic immunity	Meets 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 Block Diagram



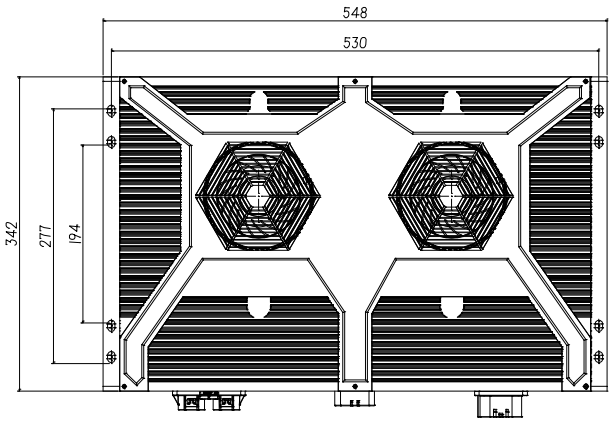
2. 3 characteristic curve

output characteristics TBD
Efficiency Curve TBD

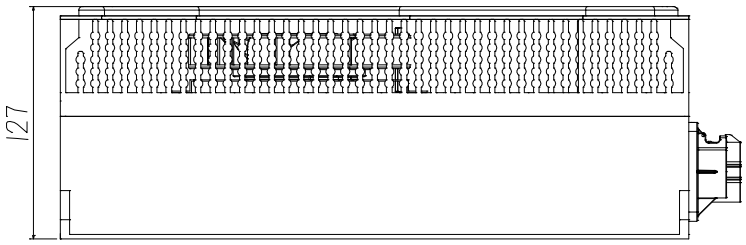
3 External dimensions and weight

3. 1 Product size

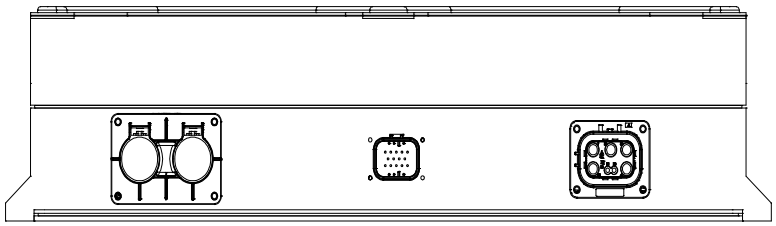
3D model data: 902.36250000.00.stp
vertical view



Right view



axonometric drawing

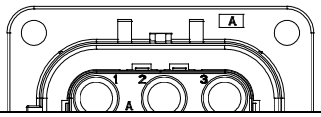


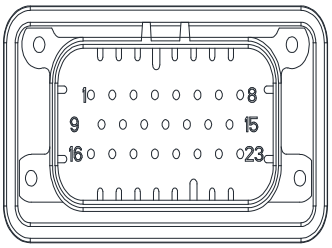
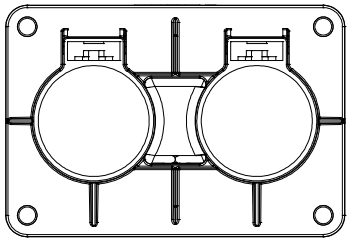
*The **connector section** is **for reference only***

3. 2 Product weight

TBD

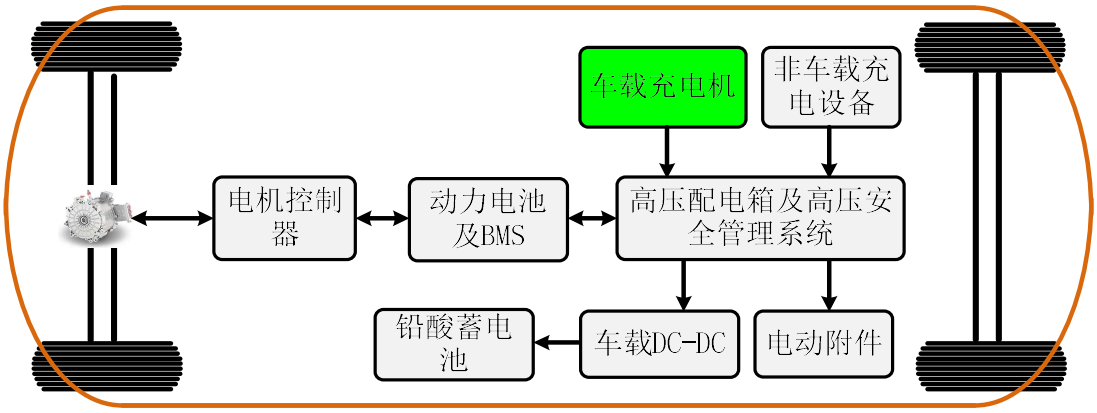
4 Definition of connectors and connection terminals

number	type	Definition of connectors		Connector drawing
1	Communication input socket BHL10-E401X-S6	1	L1	
		2	L2	
		3	L3	

		4	N	
		5	PE	
		factory		Sichuan Baile Electric
		End to end plug		BHL18-E40X1-S6
2	Signal socket 1-776228-1	20	12+	
		21	GND	
		22	CANH	
		23	CANL	
		factory		TE
		End to end plug		Sheath: 770680-1; Terminal: 770520-1
3	Output socket PRC20-301-10 M10	1	Output positive pole	
		2	Output negative pole	
		3	High voltage interlock HVIL 1	
		4	High voltage interlock HVIL 2	
		factory		Baile
		Insert it correctly		PRC18X-300-70/ PRC18Y-300-70

5 User Guide

5.1 Electrical connection diagram



5. 2 Product installation

product type	Air cooled car charger assembly	
mounting screw	Installation hole diameter	TBD
	number	TBD
	Recommended screw models	TBD

Install and fix this product

Align the installation holes, tighten the fastening screws, and secure the power supply.

Tightening distance requirements

During installation, use appropriate torque based on screw size, connection method, etc. Refer to the table below for details:

Specification and model		Tightening torque (torque range: ± 10%)/(unit: Kgf. cm)						
Large category	Subclass	Plastic - Plastic	Steel plastic Copper - Copper	General connection		High density connection		
				Steel - Steel	Copper cast aluminum Steel aluminum profiles Steel Copper	Steel - Steel	Steel cast aluminum Steel Copper	Steel aluminum profiles
Hexagon 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

project	Technical indicators	remarks
Crystal oscillator tolerance	± 0.15%	Within the working temperature range
Communication speed	**Configurable through backend software to prevent loss in case of power failure**	Tolerance is ± 0.375 Kbit/s
Sampling point	The sampling point should be set at a location close to but no later than 7/8 of the bit time	
transceiver	The maximum transceiver "ring delay" (from transmission to reception) is 300 ns	CAN transceiver should comply with ISO 11898-2 standard
Termination resistor	**The CAN communication circuit of the charger has a default communication without a 120 ohm terminal resistance**	
CAN communication protocol	TBD	

5. 4 Background Debugging Software Instructions

product type	**Car charger assembly**	
Backend software coding	3610.exe	
Communication method of backend software	can communication	Baud rate adjustable from 125K/250K/500K
Installation and usage assistance		上位机使用说明.pdf
Support CAN box Brand 1	1 Beijing Aitai USBCAN-2I 2 Beijing Aitai USBCAN-I	USBCAN Driver for Windows 10-amd64-1.0.1.exe
Support CAN box Brand 2	TBD	

5. 5 Troubleshooting and Confirmation

Fault phenomenon	Common causes of malfunctions	Troubleshooting
The charger does not power on	Communication gun has no communication input	Check the input air switch or socket before communication
	The communication connector is not properly plugged in	Re plug and unplug the connector
	The charging guidance signal connector is not properly plugged in	Re plug and unplug the signal connector
No message from charger	The signal connector is not properly connected	Re plug and unplug the signal connector
	Reverse connection of CAN line	Adjust the CAN line sequence

	Communication protocol mismatch	Compare whether the protocol matches
	Baud rate mismatch	Compare whether the baud rate matches
No high voltage output	The high-voltage output terminal is not connected to the battery	Check the high-voltage connector and wiring harness
	The charger did not receive the BMS command	View message
	The positive and negative terminals of the battery are reversed	Check the high-voltage connector and wiring harness
Overheating fault	Air cooled machine: Fan blockage or blocked air duct	Check the fan and air duct
	Water cooled machine: No coolant or coolant temperature too high	Check if the coolant is working properly

6 User Notice and Precautions

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

Warning:

It is strictly prohibited to disassemble the product for maintenance, debugging, or modification without authorization;

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

There is high voltage and high temperature inside the product. Please do not touch the internal components as it may cause electric shock or burns;

If there is any abnormal noise or odor from the power supply during use, please immediately turn off the input;

It is necessary to use connectors that meet the specifications to ensure that all plugs and sockets are securely connected. Loose connections may cause local heating and fire;

Do not charge batteries that are already damaged or cannot be charged;

Please use the power supply within the technical parameter range. If used beyond the range, it may cause product damage;

When charging the battery normally, please stay away from sources of fire and flammable and explosive materials;

Please avoid placing the product in a rainy location for a long time;

Choose a three core cable with a grounding wire for the AC power supply and install the grounding wire correctly;

Before installation, please confirm that the casing is intact and undamaged. If there is any damage, please replace it immediately or contact the manufacturer.

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 and do not plug or unplug connectors with power on;

This power input/output terminal requires an external fuse or other overcurrent protection device;

It is necessary to consider the potential electrical hazards at the output end of the product during use, to ensure that end product users do not come into contact with the product; Terminal equipment manufacturers must design corresponding protection schemes to ensure that there is no danger caused by accidental contact of power terminals by engineering personnel or tools during operation;

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

When power equipment is switched from a cold environment to a warm environment, condensation may cause leakage hazards, so grounding requirements must be strictly followed;

Only qualified personnel can connect the equipment to the power source.

Cut off the power supply and stop the machine for five minutes to allow sufficient discharge time for the capacitor before maintenance can be carried out on the power equipment.

Pay attention to safety: Avoid touching places with safety warning signs and high-voltage signs with your hands to prevent electric shock and burns.

7 Reference standards and specifications

QC/T 413-2002 Basic Technical Conditions for Automotive Electrical Equipment

QC/T 895-2011 Conductive Car Chargers for Electric Vehicles

GB/T 2423.1-2001 Environmental Testing for Electrical and Electronic Products, Part 2: Test Methods/Test A: Low Temperature

GB/T 2423.2-2001 Environmental Testing for Electrical and Electronic Products, Part 2: Test Methods/Test B: High Temperature

GB/T 2423.3-1993 Basic Environmental Testing Procedures for Electrical and Electronic Products - Test Ca: Constant Damp Heat Test Method;

GB/T 2423.4.1993 Basic Environmental Testing Procedures for Electrical and Electronic Products - Test Db: Alternating Damp Heat Test Method

GB/T 2423.5-1995 Environmental Testing for Electrical and Electronic Products, Part 2: Test Methods/Test Ea and Guidelines: Impact

GB/T 2423.6-1995 Environmental Testing for Electrical and Electronic Products, Part 2: Test Methods/Test Ea and Guidelines: Collision

GB/T 2423.8-1995 Environmental Testing for Electrical and Electronic Products, Part 2: Test Methods/Test Ed: Free Drop

GB/T 2423.10-1995 Environmental Testing for 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 Methods/Test Fd: Broadband Random Vibration

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

GB/T 14508-93 Class Road Freight Transport Machinery Environmental Conditions

GB/T 18384.3-2001 Safety Requirements for Electric Vehicles Part 3: Personnel Electric Shock Protection

GB/T 17619 Limits and measurement methods for electromagnetic radiation immunity of electronic and electrical components of motor vehicles

GB/T 18488.1-2006 Drive Motor Systems for Electric Vehicles Part 1: Technical Conditions

GB/T 24347-2009 Electric Vehicle DC/DC Converter

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

Q/FT B102-2005 Regulations on Traceability Identification of Vehicle Product Components

GB/T 17626.2-2006 Electromagnetic Compatibility Testing and Measurement Techniques - Electrostatic Discharge Immunity Test

GB/T 17626.3-2006 Electromagnetic Compatibility Testing and Measurement Techniques - Radio Frequency Electromagnetic Field Radiation Disturbance Immunity Test

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

GB/T 17626.5-2008 Electromagnetic Compatibility - Testing and Measurement Techniques - Surge (Impulse) Immunity Test

GB4943-2001 Security of Information Technology Equipment

8 Packaging, transportation, and storage

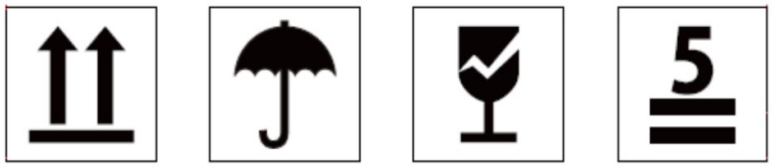
package

The product packaging information is as follows:

Packaging quantity and box information	Single module net weight Kg	**TBD**
	Outer dimensions of packaging box mm	**TBD**
	Number of modules per box	**1**
	Total weight after packaging Kg	**TBD**

The packaging box has the product name, product model, and manufacturer name; The technical documents supplied with the product in the packaging box should include the product's factory certificate of conformity.

The product should be transported in a sturdy packaging box, and the outside of the box should comply with relevant national standards and have signs such as "Handle with Care" and "Moisture proof". 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. And attach the transportation mark, as shown in Figure 7-2 below:



shipping mark

keep in storage

When the product is not in use, it should be stored in the packaging box. The warehouse environment temperature should be -10-40 ℃ and the relative humidity should not exceed 80%. Harmful gases, flammable, explosive products, and corrosive chemicals are not allowed in the warehouse, and there should be no strong mechanical vibration, impact, or strong magnetic field effects. The packaging box should be placed at least 20cm above the ground and at least 50cm away from walls, heat sources, windows, or air inlets. The storage period under these regulations 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 Version Updated Record

date	version	Reason for Change	notes
2023/10/31	V1.0		
2023/11/01	V1.1	Update connector model and signal definition	
2024/01/16	V1.2	Update the shell	
2024/08/10	V1.3	Update signal plugin	