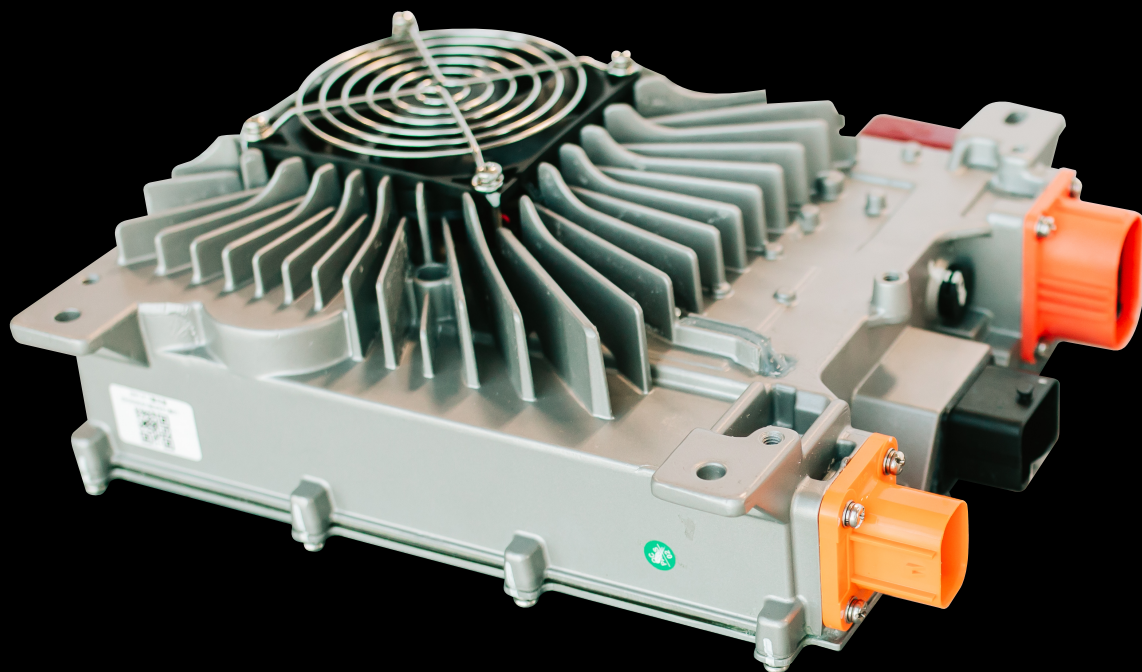




FLASH DRIVE

TC CHARGER USERS MANUAL

**MODEL: 3.3KW OBC + 1 KW
DC/DC INTEGRATED**

VERSION: 0.1

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1. BEFORE YOU BEGIN

1.1 Chapter Contents

- Overview - [1.2](#)
- Product Specifications - [1.3](#)

1.2 Overview

The CD-L Series fully sealed car OBC and DC/DC 2-in-1 integrated machine is based on Hangzhou Tiechend Information Technology Co., Ltd. according to QC/T895-2011.

1.3 Product Specifications

1. Supports UDS diagnosis, with CAN wake-up function
2. Protection level not lower than IP55
3. Working temperature threshold: -40°C to 60°C (full-sealed process)
4. Storage temperature threshold: -55°C to 100°C
5. Thermal sensor will shut OFF under hazardous operating conditions (internal $\geq 90^{\circ}\text{C}$)
6. Relative humidity threshold: 5% ~ 95%, no condensation
7. Altitude: $\leq 5000\text{m}$
8. Noise: max when working is $\leq 65\text{dB}$; meets China's standard QTC 895-2011

2. TECHNICAL SPECIFICATIONS

2.1 Chapter Contents

- **Charger Safety Regulation Specifications** - [2.2](#)
- **Charger Electrical Performance** - [2.3](#)
 - Input - [2.3.1](#)
 - Output - [2.3.2](#)
 - Low Voltage Output - [2.3.3](#)
 - Control Interface - [2.3.4](#)
 - Charger Safeguards - [2.3.5](#)
 - Other - [2.3.6](#)
- **DC/DC Converter Technical Specifications** - [2.4](#)
 - DC/DC Converter Regulations and Reference Standards - [2.4.1](#)
 - DC/DC Converter Safety Regulations Specifications - [2.4.2](#)
 - DC/DC Converter Electrical Performance - [2.4.3](#)
 - * Input - [2.4.3](#)
 - * Output - [2.4.3](#)
 - * Other - [2.4.3](#)
 - * DC/DC Converter Protection Functions - [2.4.3](#)

2.2 Charger Safety Regulation Specifications

	Condition	Requirement
Grounding Resistance Test	@25A/AC	$\leq 100M\Omega$
Input Insulation Test	@1000V/DC	$\geq 20M\Omega$
Output Insulation Test	@1000V/DC	$\geq 20M\Omega$
Input Withstand Test	@2000V/AC 1 min	Leak current $\leq 10\text{ma}$
Output Withstand Test	@2000V/AC 1 min	Leak current $\leq 10\text{ma}$
Input to Output Withstand Test	@2000V/AC 1 min	leak current $\leq 15\text{ma}$

2.3 Charger Electrical Performance

2.3.1 Input

Input Voltage Range	AC 90~265V
Frequency	47~63Hz
Input Current	$\leq 16\text{A}$
Power Factor	≥ 0.98 @ $\geq 1650\text{W}$
Stand-by Power Consumption	$\leq 5\text{W}$
Starting Inrush Current	$\leq 24\text{A}$

2.3.2 Output

Nominal Voltage	144V	312V
Output Voltage Range	50V~215V	105V-450V
Max Output Current	23A	10A
Output Power	3300W@220VAC; 1650W@110VAC	3300W@220VAC; 1650W@110VAC
Output Way	CV/CC	CV/CC
Efficiency	$\geq 94\%$	$\geq 94\%$
CV Accuracy	$\pm 1\%$	$\pm 1\%$
CC Accuracy	$\pm 2\%$	$\pm 2\%$
Ripple Voltage Coefficient	$\pm 5\%$	$\pm 5\%$
Output Voltage Rising Time	$< 5\text{S}$; overshoot $< 10\%$	$< 5\text{S}$; overshoot $< 10\%$
Shutoff Response Time	Current decreased below 10% in 300ms, and decreased to 0A in 500ms	Current decreased below 10% in 300ms, and decreased to 0A in 500ms

2.3.3 Low Voltage Output

Output Way	CV
Output Voltage	12V
Nominal Current	5.5A
CV Accuracy	$\pm 2\%$
Output Power	$\leq 66W$
Ripple Voltage Coefficient	$\leq 1\%$

2.3.4 Control Interface

CC Signal Test	100 Ω ~10k Ω
CP Signal Test	1%~99%, 5V~15V Vpp
CC Signal Output	Optional for 220 Ω and 680 Ω
Temperature Test	Two-way input; supports 1K and 10K
12V Wake-Up Input	$\leq 10mA$
12V Wake-Up Signal Output	Max 0.2A
12V CV	Sleep current $\leq 1mA$; peak current $\leq 5A$
Electronic Lock Driving	Peak current 2.9A
Electronic Lock Receiving Signal	Switch volume
CAN Communication	YES
Baud Rate	Optional for 125Kbps, 250Kbps, 500Kbps
Terminal Resistance	NOT AVAILABLE

2.3.5 Charger Safeguards

	144V	312V
Input Over-Voltage Protection	AC270±5V	AC270±5V
Input Low-Voltage Protection	AC85±5V	AC85±5V
Output Over-Voltage Protection	>220±5V	>455±5V
Output Low-Voltage Protection	<45±5V	<100±5V
Over-Temperature Protection	Power will start to decrease when internal temperature rises to 85°C; power will shut OFF when internal temperature rises to 90°C	Power will start to decrease when internal temperature rises to 85°C; power will shut OFF when internal temperature rises to 90°C
Output Short Circuit Protection	Stops output	Stops output
Output Polarity Reverse Protection	YES	YES
Grounding Protection	≤100mΩ	≤100mΩ
CAN Communication Protection	Automatically stops output when CAN communication fails	Automatically stops output when CAN communication fails
Power OFF Protection	YES	YES

2.3.6 Other

Humidity Test	Meets QCT 895-2011 7.2.1
Low Temperature Working Test	Meets QCT 895-2011 7.2.2.1
Low Temperature Storage Test	Meets QCT 895-2011 7.2.2.2
High Temperature Working Test	Meets QCT 895-2011 7.2.2.3
High Temperature Storage Test	Meets QCT 895-2011 7.2.2.4
Salt Spray Test	Meets QCT 895-2011 7.8.5
EMI	Meets GB/T 18487.3-2001 11.3.1 and GB/T 18655-2018
EMD	Meets GB/T 18487.3-2001 11.3.2 and GB/T 18655-2018
Harmonic Current	Meets GB 17625.1-2003 6.7.1.1
Protection Level	IP67
Vibration Resistance	10-25Hz swing 1.2mm; 25-500Hz 30m/s ² ; 8 hours each direction
MTBF	150000H

2.4 DC/DC Converter Technical Specifications

2.4.1 DC/DC Converter Regulations and Reference Standards

No.	Standard Code	Description
1	GB/T 24347-2009	Electric vehicle DC/DC converter
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 shock to personnel
5	GB/T 18387-2008	Limits and measurement methods for electromagnetic field emission intensity of electric vehicles
6	GB 9254-2008	Limits and methods for measurements of radio harassment for information technology equipment
7	GB/T 18655-2010	Limits and measurement methods for radio disturbance characteristics of vehicles, ships, and internal combustion engines used to protect vehicle-mounted receivers
8	GB 29743-2013	Motor vehicle engine coolant
9	GB 4208	Enclosure protection level (IP code)
10	GB/T 28046-2	Environmental conditions and tests for electrical and electronic equipment for road vehicles - part 2: electrical loads
11	GB/T 28046-3	Road vehicles - environmental conditions and tests for electrical and electronic equipment - part 3: mechanical loads
12	GB/T 28046-4	Environmental conditions and tests for electrical and electronic equipment for road vehicles - part 4: climatic loads
13	GB/T 2423.34-2012	Environmental test - part 2: test method test Z/AD: combined temperature/humidity cycle test
14	GB/T 2423.1-2008	Environmental testing of electrical and electronic products - part 1: test methods - test B: low temperature
15	GB/T 2423.2-2008	Environmental tests for electrical and electronic products - part 2: test methods - test B: high temperature
16	GB/T 2423.3-2008	Electrical and electronic products - environmental tests - part 2: test methods - Cab: constant heat and humidity test
17	GB/T 2423.17-2008	Environmental tests for electrical and electronic products - part 2: test methods: salt spray

No.	Standard Code	Description
18	GB/T 30512-2014	Prohibited substances requirements for automobiles
19	QC/T 413	Basic technical conditions of automotive electrical equipment

2.4.2 DC/DC Converter Safety Regulations Specifications

	Condition	Requirement
Grounding Resistance Test	@25A/AC	$\leq 100\text{m}\Omega$
Input Insulation Test	@1000V/DC	$\geq 20\text{m}\Omega$
Input Withstand Test	@2000V/DC 1min	Lead current $\leq 10\text{ma}$

2.4.3 DC/DC Converter Electrical Performance

Input

Nominal Voltage	144V	312V
Input Voltage Range	80V~195V	205V~455V

Output

Nominal Output Voltage	14V
Output Voltage Range	9~15V
Nominal Output Current	72A
Peak Current	86A
Nominal Power	1000W
Peak Power	1200W, lasts 6 minutes
Efficiency	$\geq 94\%$
Dynamic Response Time	$< 50\text{ms}$
Voltage Regulation	$\leq 1\%$
Load Regulation	$\leq 1\%$
Voltage Control Accuracy	$\leq 1\%$
Current Control Accuracy	$\leq 2\%$
Quiescent Current	$\leq 1\text{mA}$ @ 14V
Ripple Voltage Coefficient	$\leq 2\%$ @ nominal working state

Other

Humidity Test	Meets GB/T 24347-2009, 6.1.2
Low Temperature Test	Meets GB/T 24347-2009, 6.1.1.1
High Temperature Test	Meets GB/T 24347-2009, 6.1.1.2
EMI	Meets GB/T 17619-1998, Article 4
EMD	Meets GB 18655-2002, Articles 12 and 14
Protection Level	IP67
Vibration Resistance	10~25Hz swing 1.2mm, 25-500Hz 30m/s ² , 8 hours each direction
MTBF	150000H

DC/DC Converter Protection Functions

Input Over-Voltage Protection	144V = >200±5V; 320V = >460±5V
Input Low-Voltage Protection	144V = <75±5V; 320V = <200±5V
Output Over-Voltage Protection	Output voltage over-voltage protection threshold is 16±0.5V; working recovery after voltage back to ≤14±0.2V
Output Low-Voltage Protection	Output voltage low-voltage protection threshold is 7±1V; working recovery when voltage rise to ≥9±0.2V
Output Over-Current Protection	Stop output when output current >90A
Over-Temperature Protection	Power starts to decrease when internal temperature rises to 100°C; shuts off when rises to 110°C; auto-recovery when power decreased
Short Circuit Protection	Yes, auto-recovery

3. INTERFACE

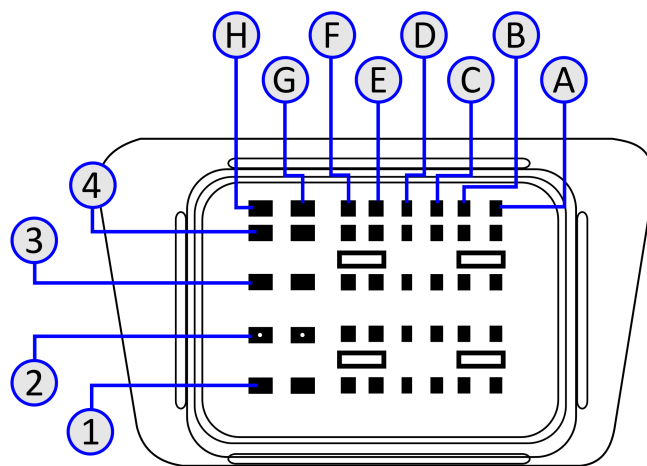
3.1 Chapter Contents

- **Low Voltage Connector and Pins** - [3.2](#)
- **High Voltage Connector and Pins** - [3.3](#)
 - AC Input - [3.3.1](#)
 - OBC Output and DC/DC Input - [3.3.2](#)

The interfaces in the charger can be grouped into two categories; **low voltage** and **high voltage**. The low voltage interface includes control connector and DC/DC output. The high voltage interface includes AC220V input, OBC output, and DC/DC input. Connectors can be appointed by customer if quantity in order is more than 5000 pieces.

3.2 Low Voltage Connector and Pins

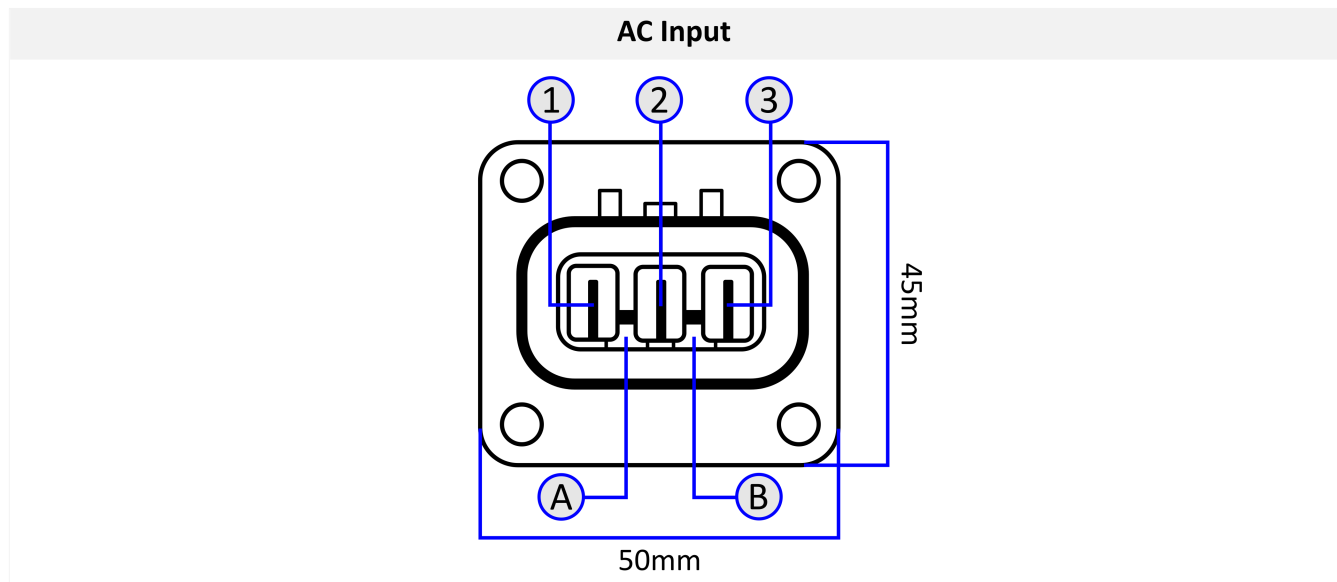
Low Voltage Pins



Pin	Name	Definition	Description
1H	KL30 positive	9-16V battery +; hot at all times	Constant power supply input 0-16V; peak current 3A (electronic lock locking); time 1.5s; sleep current $\leq 1\text{mA}$
2A	HW-wakeup-out	Output wake-up signal	Output 12V controlled voltage signal wakes up the external device; max current is 200mA
2B	IN-wakeup-EN	Input wake-up signal	Input 12V signal wakes up the sleeping OBC; internal resistance 10K; current 1mA
2C	DC/DC 12V enable	DC/DC 12V enable input	
2F	CAN/GND		
2H	12V5A+	OBC low voltage power supply +	By controlled to output 13.8V; max output current capacity 5.5A (a long time)
4A	CAN-H	CAN-H	
4B	CAN-L	CAN-L	
4G	KL31 negative	9-16V battery negative; connected all the time	Can be connected with OBC grounding; voltage is 0V; peak current is 5A

3.3 High Voltage Connector and Pins

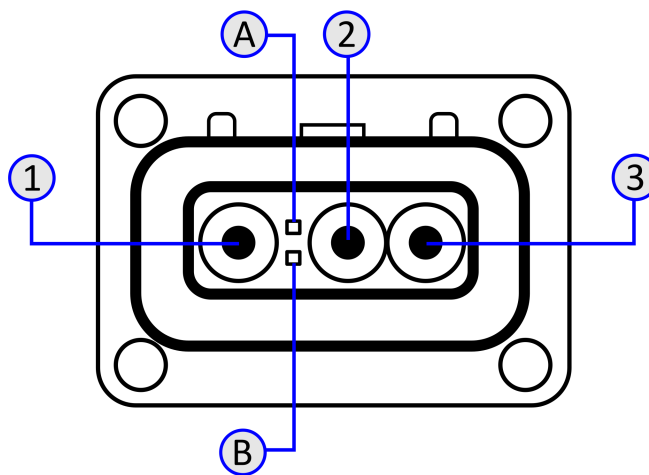
3.3.1 AC Input



Brand	Pin	Definition	Wire Diameter
Xinxi	1	Live (L)	2.5
Xinxi	2	Ground wire (PE)	2.5
Xinxi	3	Neutral line (N)	2.5

3.3.2 OBC Output and DC/DC Input

OBC Output DC/DC Input



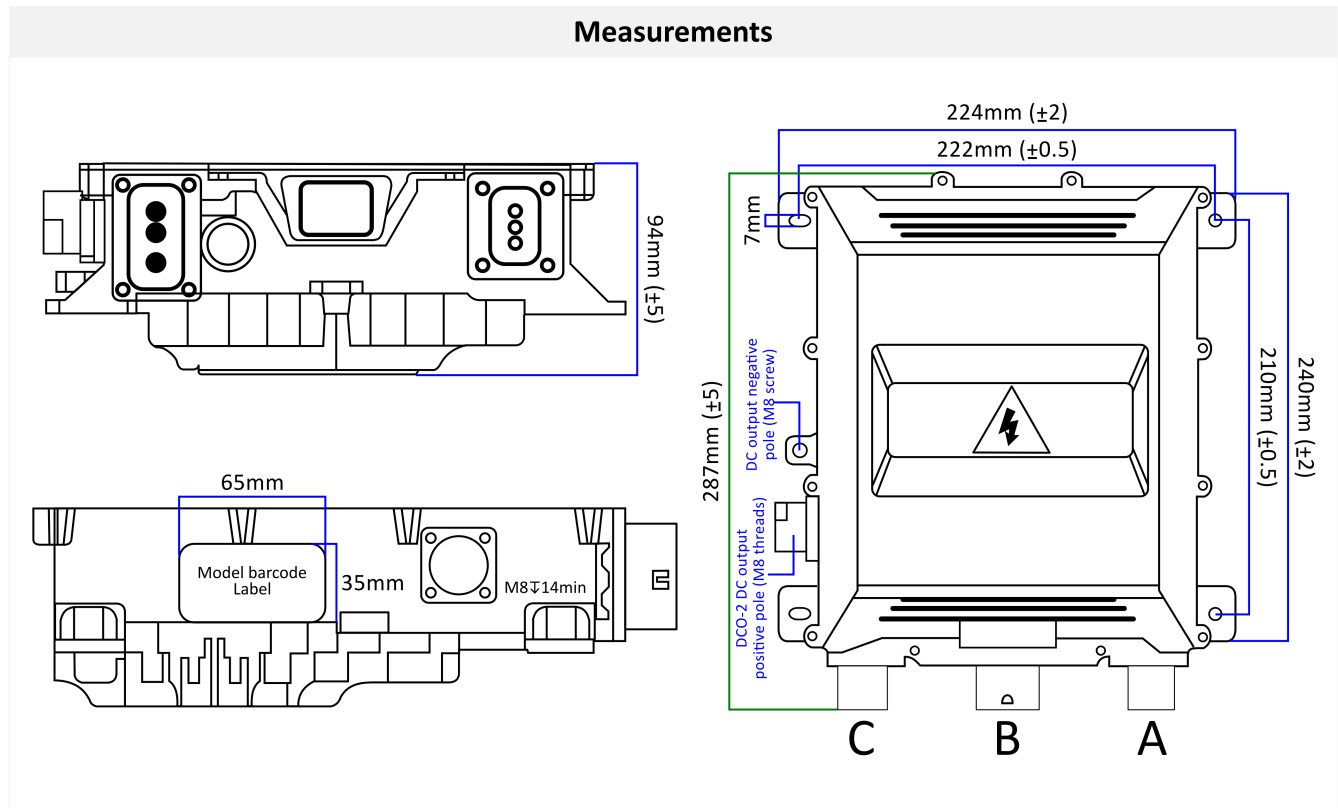
Brand	Pin	Definition	Wire Diameter
Xinxi	1	OBC output +	2.5
Xinxi	2	Sharing -	2.5
Xinxi	3	DC input +	2.5
Xinxi	A, B	HVIL	0.5

4. INSTALLATION AND MEASUREMENTS

4.1 Chapter Contents

- Converter Measurements - [4.2](#)
- Installation Orientation - [4.3](#)

4.2 Converter Measurements



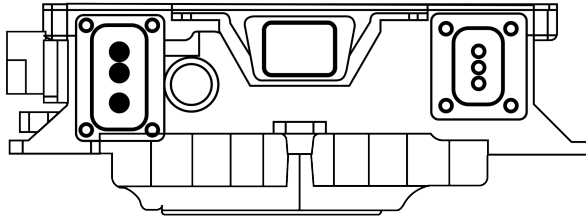
4.3 Installation Orientation

Installation Orientation

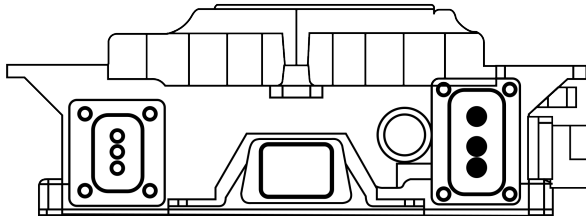
WARNING: Charger should be installed at least 50mm away from other objects



Proper Installation Orientation



Improper Installation Orientation



Proper Installation Orientation

