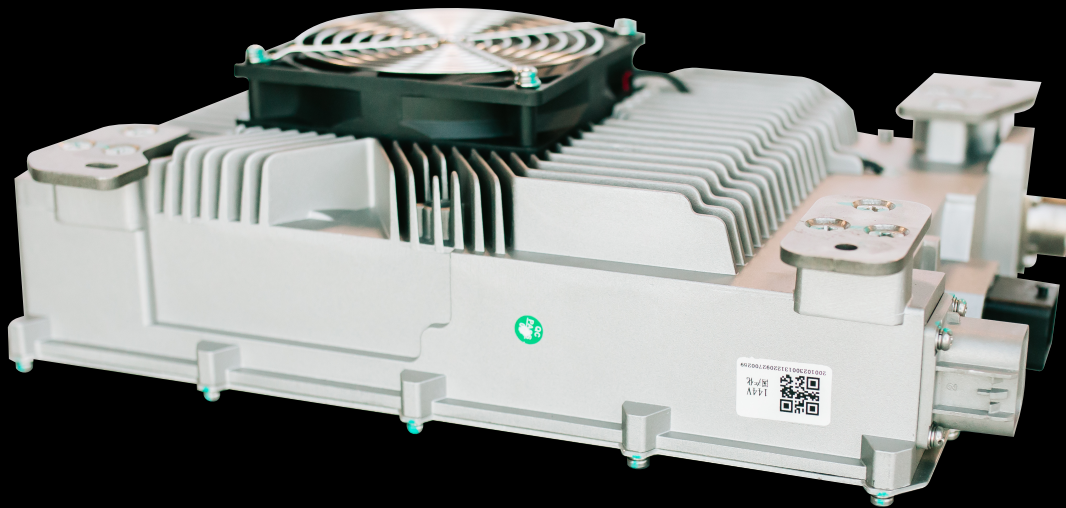




FLASH DRIVE

TC CHARGER USERS MANUAL

**MODEL: 6.6KW OBC + 1.5 KW
DC/DC INTEGRATED**

VERSION: 0.1

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Flash Drive Motors
20201 Cameron Road
Coupland, Texas 78615
United States of America

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CONTENTS

1	Before You Begin	5
1.1	Chapter Contents	5
1.2	Overview	6
1.3	Product Specifications	6
1.4	Model Definition Table	6
2	Technical Specifications	7
2.1	Chapter Contents	7
2.2	OBC Technical Specifications	8
2.3	DC/DC Technical Specifications	10
2.4	Circuit Diagram	12
2.5	Water Cooling Data	13
2.6	Charger Size	14
2.7	Data Charts	14
3	Connections	18
3.1	Chapter Contents	18
3.2	Input Connections	19
3.3	Other Connections	20

1. BEFORE YOU BEGIN

1.1 Chapter Contents

- Overview - [1.2](#)
- Product Specifications - [1.3](#)
- Model Definition Table - [1.4](#)

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. Full potting process
2. Air cooling
3. Built-in temperature sensor
4. IP67 waterproof
5. Temperature threshold: -40°C to 65°C
6. Output can be turned OFF under hazardous operating conditions (internal 90°C)
7. Can work safely under short-term flooding conditions

1.4 Model Definition Table

Model	Volt	Hardware	Charger Pwr	DC/DC Hardware	Power	Method
CD-LW01	144V	HK-LW-144-46	6K6W	TDC-JH-144-12	1K5W	Water cooling
CD-LW02	312V	HK-LW-312-20	6K6W	TDC-JH-320-12	1K5W	Water cooling
CD-LW03	540V	HK-LW-540-12	6K6W	TDC-JH-540-12	1K5W	Water cooling
CD-LW04	108V	HK-LW-108-64	6K6W	TDC-JH-108-12	1K5W	Water cooling
CD-LW05	216V	HK-LW-216-28	6K6W	TDC-JH-216-12	1K5W	Water cooling
CD-LF01	144V	HK-LF-144-46	6K6W	TDC-JH-144-12	1K5W	Air cooling
CD-LF02	312V	HK-LF-312-20	6K6W	TDC-JH-320-12	1K5W	Air cooling
CD-LF03	540V	HK-LF-540-12	6K6W	TDC-JH-540-12	1K5W	Air cooling
CD-LF04	108V	HK-LF-108-46	6K6W	TDC-JH-108-12	1K5W	Air cooling
CD-LF05	216V	HK-LF-216-28	6K6W	TDC-JH-216-12	1K5W	Water cooling

2. TECHNICAL SPECIFICATIONS

2.1 Chapter Contents

- OBC Technical Specifications - [2.2](#)
- DC/DC Technical Specifications - [2.3](#)
- Circuit Diagram - [2.4](#)
- Water Cooling Data - [2.5](#)
- Charger Size - [2.6](#)
- Data Charts - [2.7](#)

2.2 OBC Technical Specifications

	108V	144V	216V	312V	540V
Voltage Range	36~145V	50~198V	70~290V	110~440V	170~650V
Output Current	64A	46A	28A	20A	12A

	108V, 144V, 216V, 312V, 540V
Output Power	6600W @ 220VAC, 3300W @ 110VAC
Output Method	CC/CV
Voltage Accuracy	±2%
Ripple Volt	5%
Input Voltage	AC 90~265V
Frequency	45-65Hz
Input Current	32A
PFC	≥0.99 more than a half load
Efficiency	≥93% full load
Standby Power	≤5W
Output Method	CV
Output Voltage	13.8V
Output Current	5A
Voltage Accuracy	±2%
Output Power	≥62.5W
VCC	1%
Overvolt Protection	AC270±5V
Low Volt Protection	AC85±5V
Output Over	Over max voltage ±2% stop out pause
Output Lowvolt	Lower than lowvolt-5% out pause
Over Current	Higher than max charge current, ±5% out pause
Over Temperature	The power starts to drop at 85°C and stops at 90°C
Short Circuit	Stop output
Reverse	Yes
Ground Protection	≤100mΩ
CAN	Automatically stop output when CAN communication fails
Cut Off	Yes
CC Signal Detection	100 OHM - 3.3k-gigantic
CP Signal Detection	0% - 100%, 5V - 15V Vpp

	108V, 144V, 216V, 312V, 540V
CC Signal Output	220 OHM or 680 OHM
Temperature Protection	Supports 1K and 10K
12V Wake Up Input	$\leq 10\text{mA}$
12V Signal Wake Up	MAX 0.2A
12V Constant Current	Sleep current $\leq 1\text{mA}$, peak current $\leq 5\text{A}$
Lock Electromagnetic Drive	MAX peak current 5A
Electromagnetic Lock in Place Signal	Switch
CAN	Yes
KPBS	125 KBPS, 250 KPBS, 500 KPBS
Terminal Resistor	No
Withstand Voltage	Input to output: 2500 VAC $\leq 10\text{mA}$, Input to ground: 2000 VAC $\leq 10\text{mA}$, Output to ground: 2000 VAC $\leq 10\text{mA}$, 1 min
Ground Resistance	Resistance between ground point and heat sink is less than 100 milliohms, test current 25A AC
Insulation Resistance	Input output to shell $\geq 10\text{M}\Omega$, testing volt 1000 VDC
Electromagnetic Immunity	GB/T 18487.3-2001
Electromagnetic Harassment	GB/T 18487.3-2001, 11.3.2
Harmonic Current	GB 17625.1-2003, 6.7.1.1
Start Shock Current	$\leq 24\text{A}$
Current Rise Time	$\leq 5\text{S}$, overshoot $\leq 5\%$
Off Response Time	100% to 10% $\leq 50\text{mS}$, 100% to 0% $\leq 200\text{mS}$
IP Standard	IP67
Vibration Resistance	10-25Hz amplitude 1.2mm, 25-500Hz 30m/s ² , 8 hours per direction
Noise	$\leq 60\text{dB}$ (class A)
MTBF	150000H
Working Environment	5% - 95% no condensation
Working Temperature	-40 ~ 65°C
Storage Temperature	-55C ~ 85°C
Over Temperature	When temperature reaches 90° component stops working; after cooling, power supply will recover

2.3 DC/DC Technical Specifications

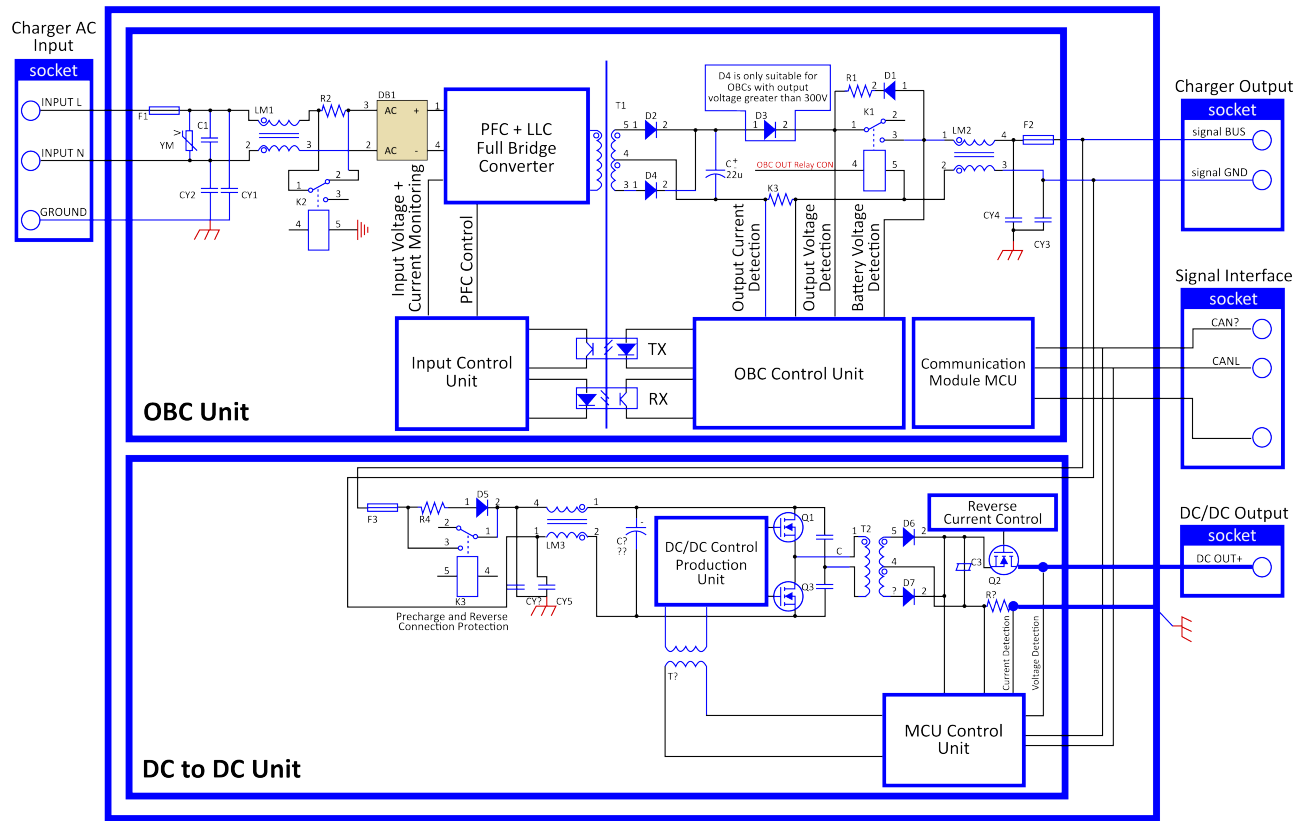
	TDC-JH-108-12	TDC-JH-144-12	TDC-JH-320-12	TDC-JH-320-12	TDC-JH-540-12
Rated Voltage	DC108V	DC144V	DC216V	DC320V	DC540V
Rated Current	10A	8A	5A	3.5A	2A
Peak Current	$\leq 17A$	$\leq 13A$	$\leq 9.3A$	$\leq 6.2A$	$\leq 3.25A$
Input Volt Range	85-145V	110-200V	150-300V	220-450V	420-650V
Low Volt Protect	80V $\pm$ V	105V $\pm$ 5V	145V $\pm$ 5V	215V $\pm$ 5V	400V $\pm$ 5V
Over Volt Protect	150V $\pm$ 5V	215V $\pm$ 5V	305V $\pm$ 5V	455V $\pm$ 5V	660V $\pm$ 10V
Start Time	$\sim 0.9s$ @	$\sim 0.9s$ @	$\sim 0.9s$ @	$\sim 0.9s$ @	$\sim 0.6s$ @

	VIN = 108V, 144V, 216V, 320V, 540V
Output Volt	14.0V $\pm$ 1%
Rated Current	110A
Peak Current	13A-140A
Rated Power	1500W
Peak Power	1800W, constant for 6 min
Efficiency	$\geq 95\%$
Output Voltage Transient Response	$\leq 50ms$
Voltage Adjustment Rate	1%
Load Regulation	1%
Voltage Accuracy	$\leq 1\%$
Current Accuracy	$\leq 2\%$
Output Leakage Current	$\leq 5mA$
Output Ripple	$\leq 276mV$ @ 12V
12V Enable Volt	6-30V

	108V, 144V, 216V, 320V, 540V
12V Enable Current	$\leq 1\text{mA}$
Overcurrent Protection	Max current 110%
Overvoltage Protection	15-16V @ 12V
Low Voltage Protection	Output volt 50%
Over Temp Protection	At internal temperature of 85°C power begins to degrade; at 90°C product turns OFF (self-recovery)
Overvoltage Protection	Yes; automatic
Low Voltage Protection	Yes; automatic
Short Circuit Protection	Yes; automatic
Working Temperature	-30 ~ 65°C
Storage Temperature	-40 ~ 90°C
Humidity	5% ~ 95%
IP Standards	GB4208-2008 IP67
Insulation Resistance	Less than 2M ω at an ambient temp of 23°C ($\pm 2^\circ\text{C}$); relative humidity 80-90%
Electromagnetic	GB/T 18655-2002; reliability is derived from device failure rate as MTBF300000 H

2.4 Circuit Diagram

OBC to DC/DC Two-in-One Principle Block Diagram



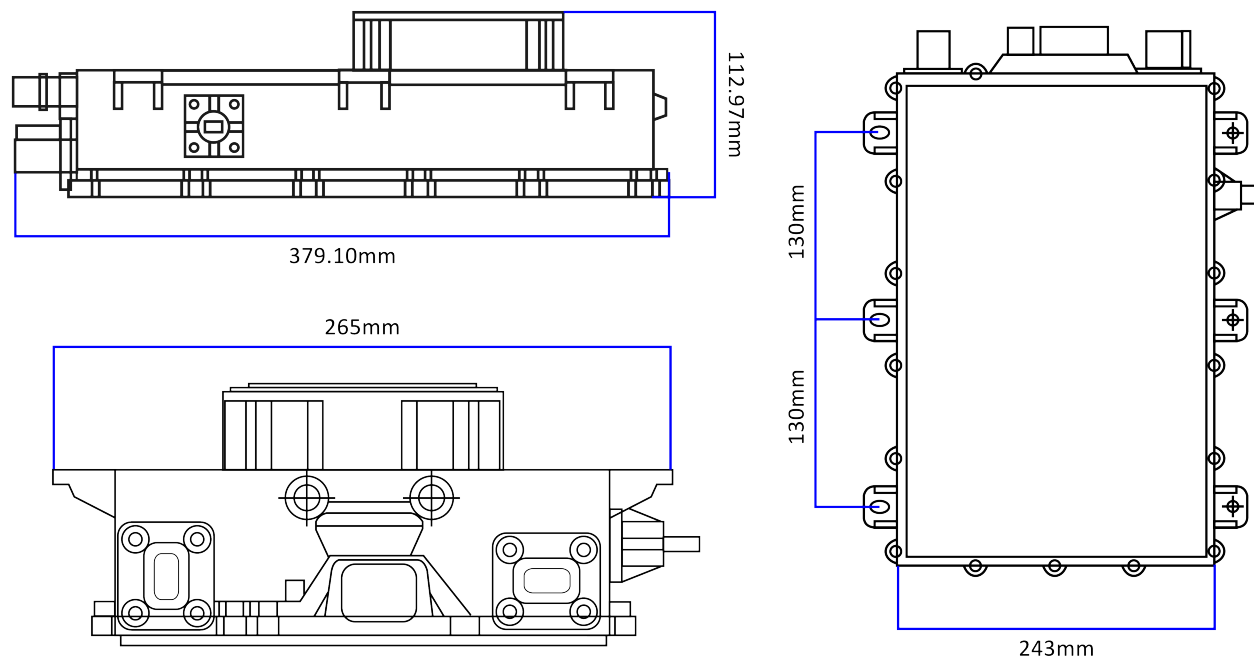
2.5 Water Cooling Data

1. Outlet pipe size: $\psi 20\text{mm}$
2. Flow: Greater than or equal to 5L/min
3. Pressure: 200Kpa
4. Capacity: 0.25L
5. Maximum inlet water temperature: 60°C

	Flow (L/min)	Power Consump- tion (W)	Inlet Water Temp (C)	Temp Rise (C)	Thermal Resis- tance (C/W)	Pressure Drop (Kpa)
1	5	395	20	17.2	0.044	1.6
2	10	395	20	14.7	0.037	6.8
3	15	395	20	13.4	0.034	15.0
4	20	395	20	12.6	0.032	27.0

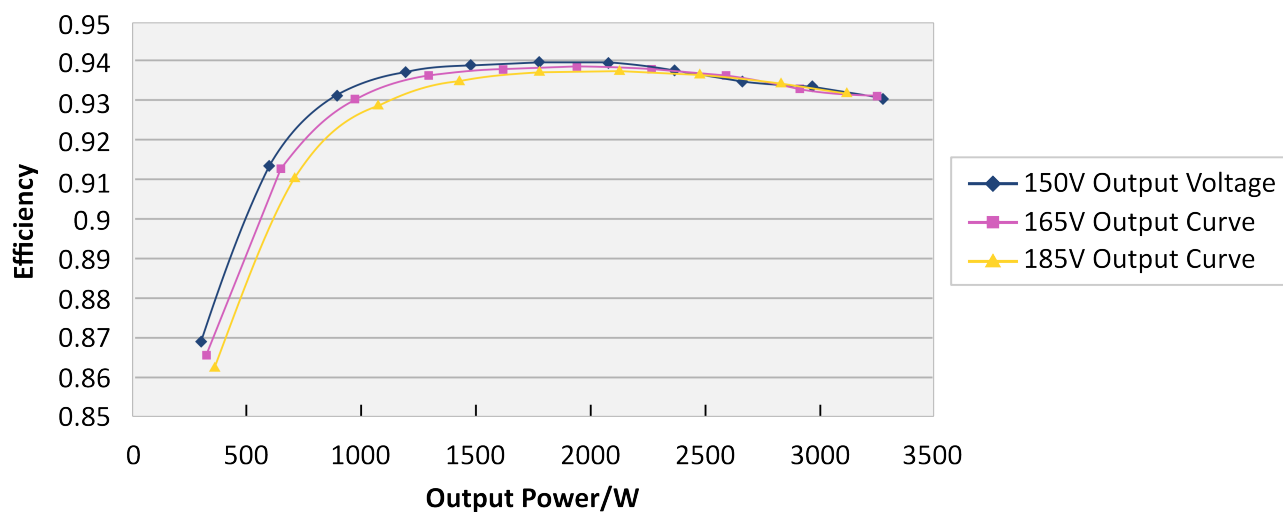
2.6 Charger Size

TC Charger Measurements

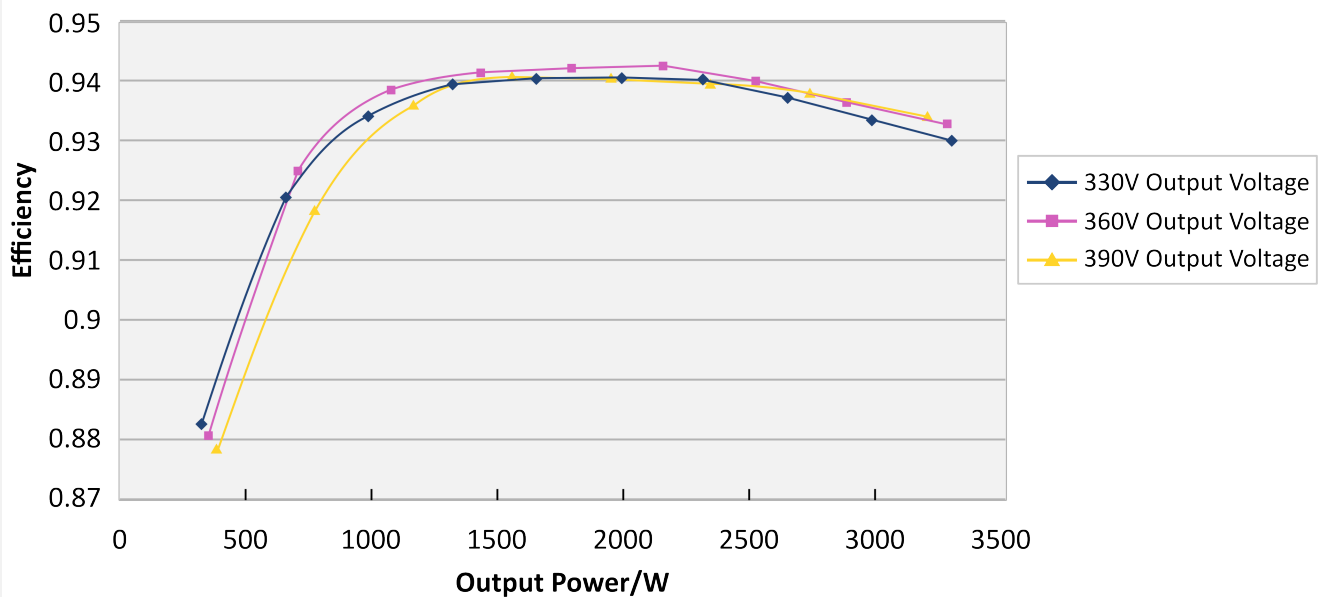


2.7 Data Charts

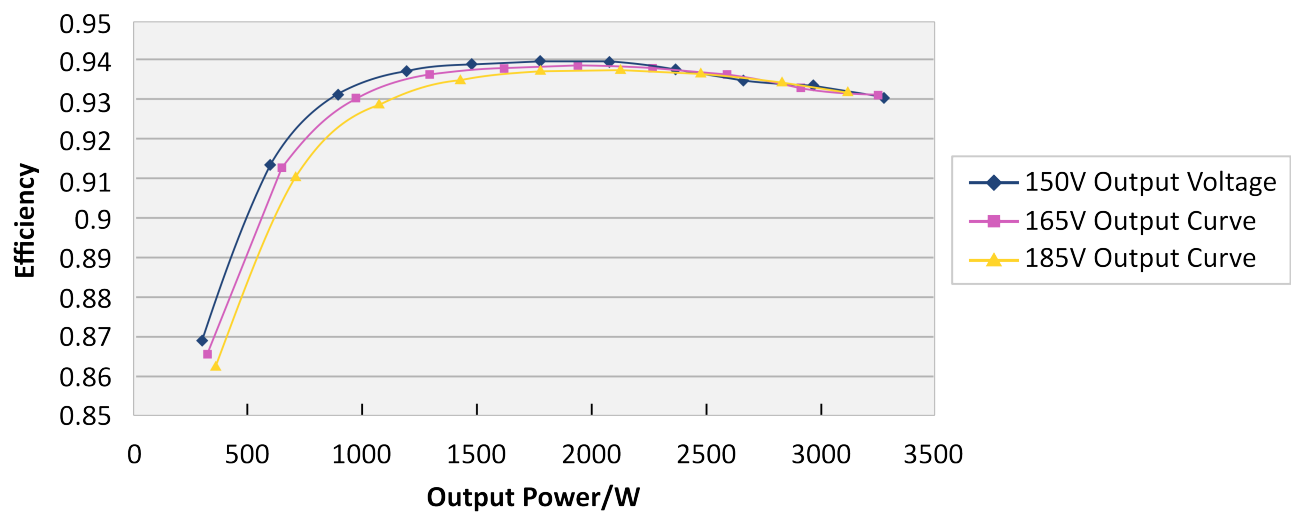
3.3KW 144 V Efficiency Curve



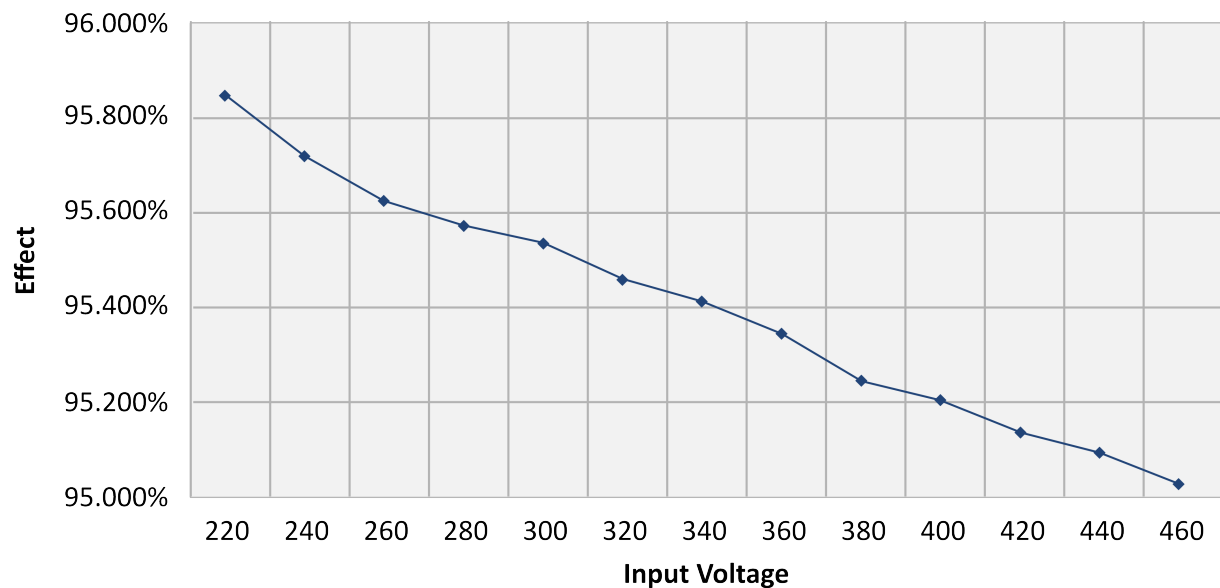
3.3KW 312V Efficiency Curve



3.3KW 540V Efficiency Curve

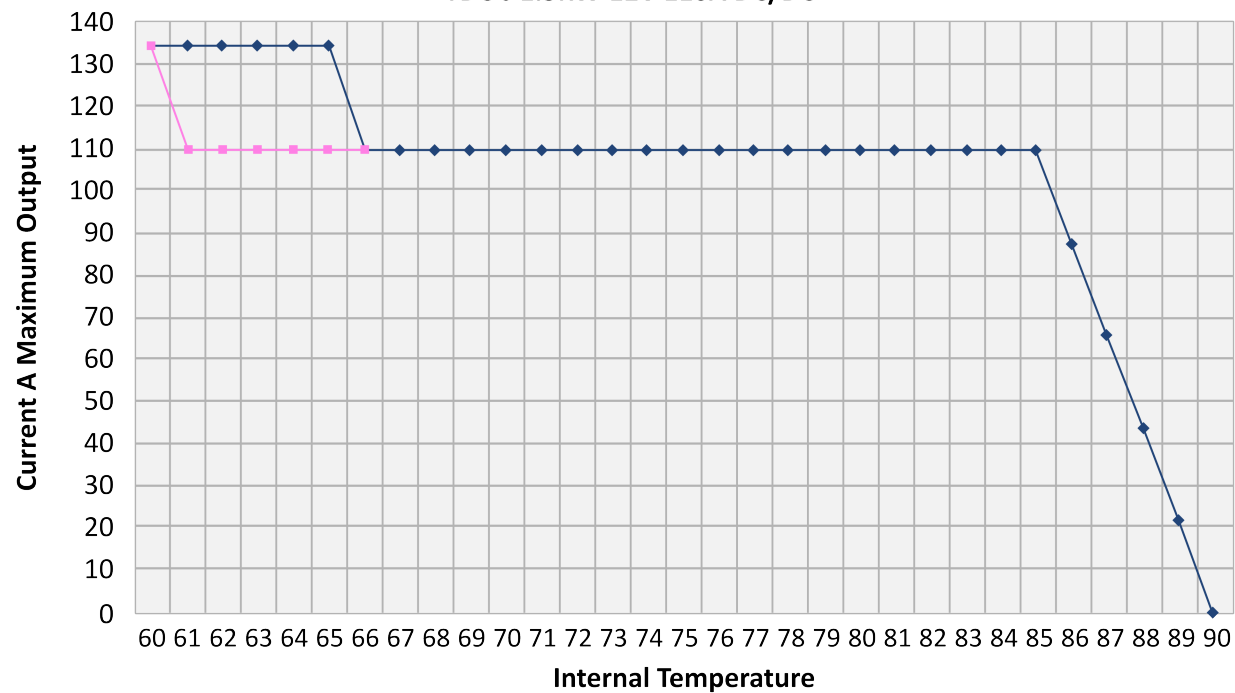


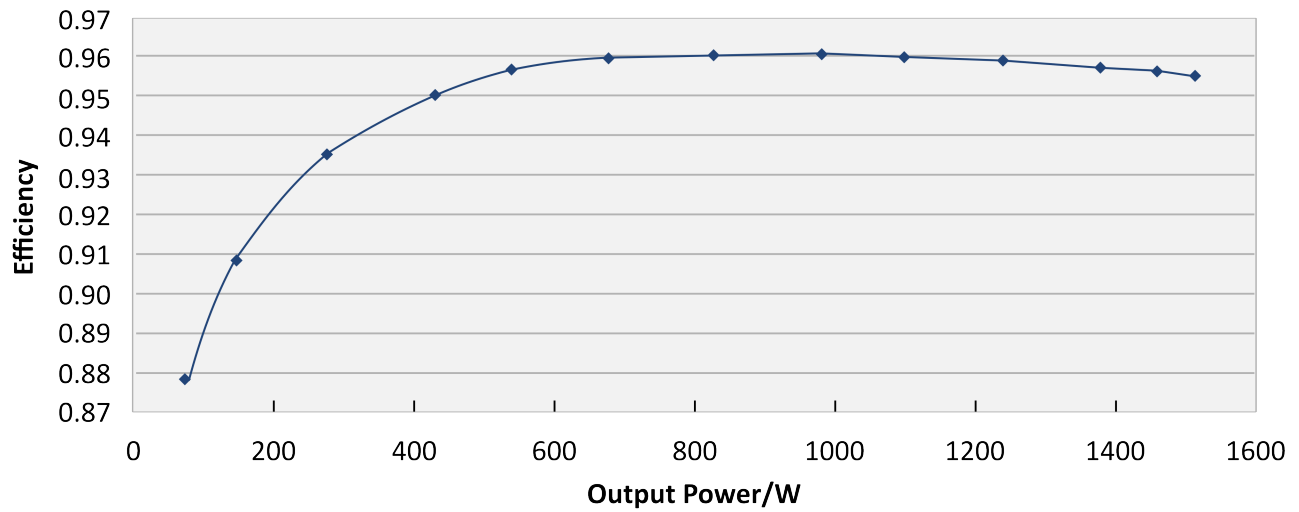
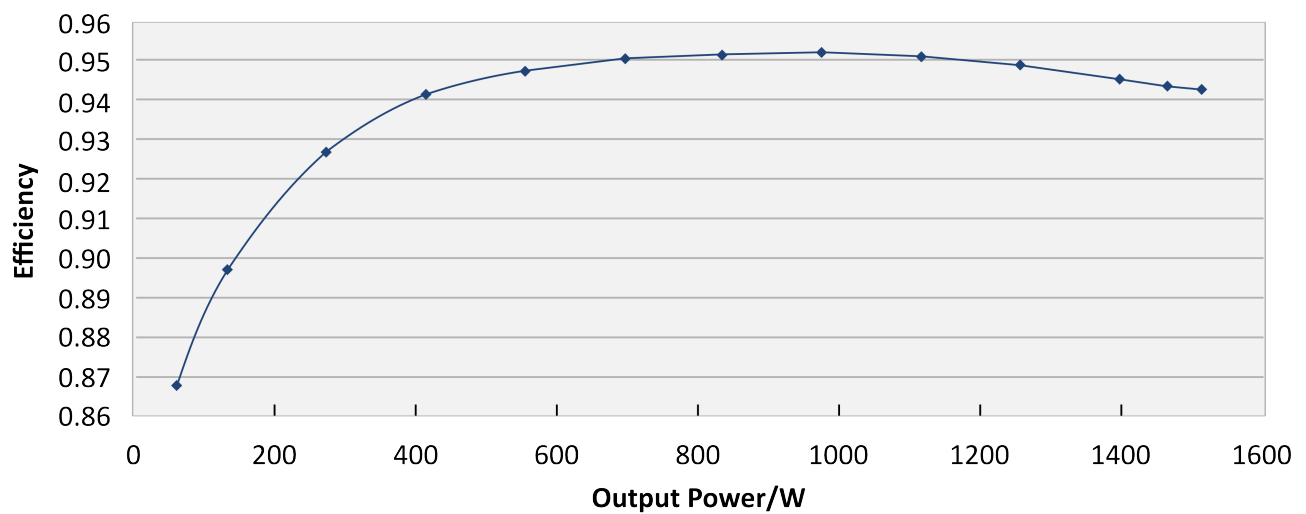
340V-12V Efficiency Curve (Output 1.5KW)



Temperature Reduction Power Curve

TDC-J 1.5KW-12V 110A DC/DC



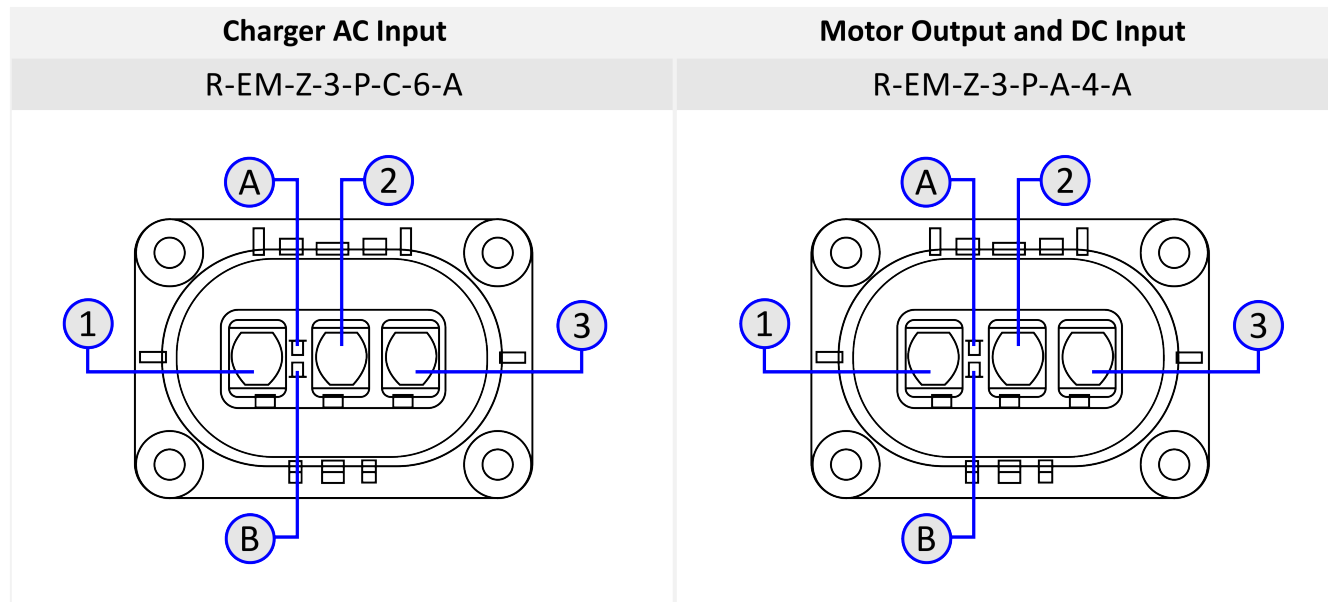
1.5KW DC Efficiency Curve (320V-12V)**1.5KW DC-DC Efficiency Curve (144V-12V)**

3. CONNECTIONS

3.1 Chapter Contents

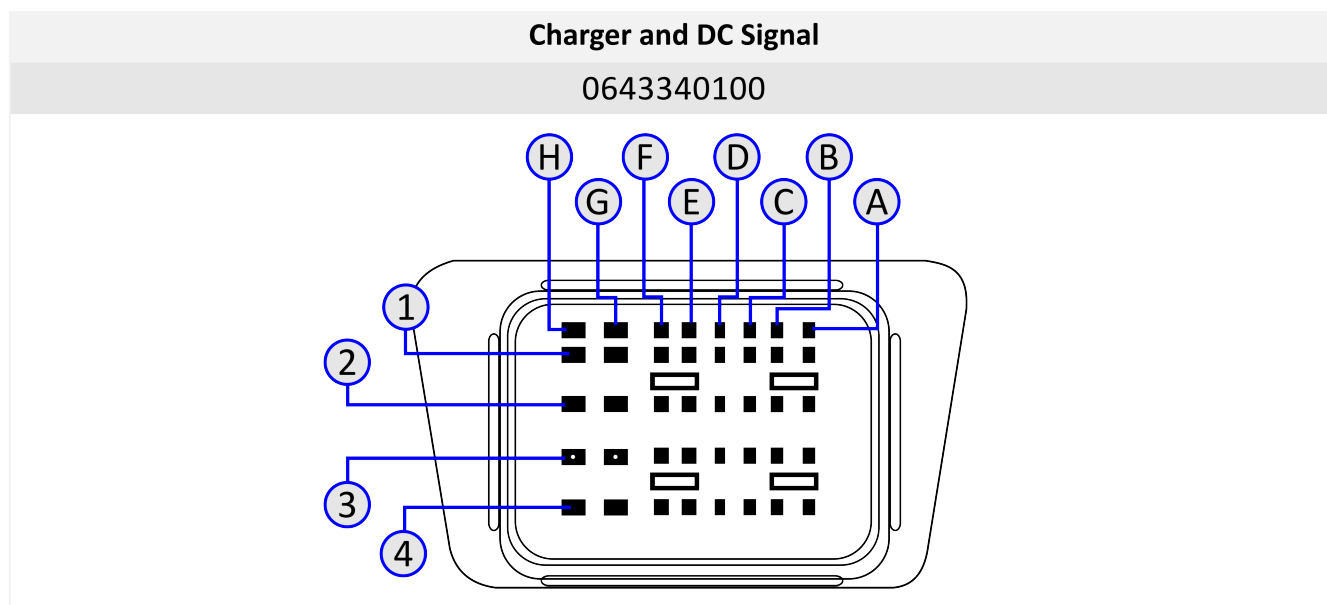
- Input Connections - [3.2](#)
- Other Connections - [3.3](#)

3.2 Input Connections



	Port	Terminal Definition	Connector Model	Mating Connector	Factory
1	AC Input	1-Fire, 2-Ground, 3-Zero	R-EM-Z-3-P-C-6-A	R-EM-T-3-P-C-6-A	Ricotta
2	DC Input	1-Output Positive, 2-Negative, 3-DC Input Positive	A-4-A	A	
3	DC Signal				
4	DC Output Positive	M8 threaded hole			
5	DC Output Negative	M8 threaded hole			

3.3 Other Connections



No.	Definition		
1A	Thermistor 1+	AC gun, L-line temperature sensor	
1B	Thermistor 1-	AC gun, L-line temperature sensor 1-2	
1C	Thermistor 2+	AC gun, L-line temperature sensor 2-1	
1D	Thermistor 2-	AC gun, L-line temperature sensor 2-2	
1E	External indicator (red)	External indicator (red)	
1F	External indicator (green)	External indicator (green)	
1G	N/A		
1H	KL30 constant input	Normal power supply input is positive	
2A	Current	Output wake-up signal	Rated current 200mA
2B	HW wake-up output	Input wake-up signal	OBC input 12V wake-up signal
2C	IN wake-up EN	One machine	DC EN (DC/DC signal 12V-24V)
2D	N/A		Error indication (DC)
2E	N/A		Work instructions (DC)

No.	Definition		
2F	CAN/GND		(formerly 3E)
2G	N/A		
2H	OBC low voltage power supply	OBC low voltage power supply	Output voltage - 13.8V, Current - 5.5A
3A	Charging connection confirmation	CC signal	
3B	CC charging connection guide CP	CP signal	
3C	Charge lock signal (680)		Optionally wherein the connection resistance signal is according to a set of charging guns
3D	Charge lock signal (100)		
3E	N/A		
3F	Feedback wire 3	Feedback wire 3	
3G	(A)		
3H	Lock power +	Lock the charging plug	
4A	CAH-H	CAN high-end	To CAR CAN-H
4B		CAN low-end	To CAR CAN-L
	Connector interlock signal HVIL+	High voltage connector interlock signal 14E	Connect to the vehicle controller to detect HIGH
	Connector interlock signal HVIL-	High voltage connector interlock signal 2	Voltage direct current connector is connected
	Electronic lock 2 (K/E)		
	Electronic lock feedback line 1 (C)		
	KL31 input-		Constant current input negative according to customer requirements, seek to communicate with OBC ground
	Electronic lock power supply-		