3.5kW, 48Vout Electric Vehicle Li-Ion Charger Data Sheet

Description:

The EVC-3500-Watt Ruby™ Series supports a constant current, constant voltage, and constant power charging. The charging current and voltage are controlled through CAN communication. The charger has been designed for a variety of applications including the On-Board charging of Electric Vehicles and battery systems contained within them.

Features:

- Universal AC (90~264Vac) Input
- Ideal for 48V Battery Applications
- Communications via CAN Bus
- Fan or Liquid Cooled Options
- Efficiency Up to 93%
- Fully Encapsulated
- Over Voltage Protection
- Short Circuit Protection
- Over Temperature Protection
- Reverse Polarity Protection
- Waterproof IP66 Enclosure
- J1772 Options

Model Selection Table

AC Input Voltage	Output			Efficiency (typ.)	Model Number (factory number)	J1772	Cooling
	Power	Output Voltage	Current				
90 – 180V	2400W* @ 120VAC	35 – 60VDC	40A @ 120VAC	92% @ 120Vin	**EVC-60-3500-FC** (PLD3500-EVCS03-48)	No	**Fan** cooling
					EVC-60-3500-J1772-FC (PLD3500-EVCS03-48FJ)	Yes	
180 – 264V	3500W @ 230VAC		60A @ 230VAC	93% @ 230Vin	**EVC-60-3500** (PLD3500-EVCS03-48L)	No	**Liquid** cooling
					EVC-60-3500-J1772 (PLD3500-EVCS03-48LJ)	Yes	

* Input current is limited to 16A max. (±0.5A).

Specifications*:*

Conditions: All Models at 25 ºC ambient, 230Vac in and full load unless noted.
                 Specification is subject to change without notice.

Input Parameters		Min	Typ.	Max	Units
Input Voltage Range (Designed for optimum performance at 120 and 230Vin nominal)		90	120/230	264	VAC
Input Frequency			45 – 65		Hz
Power Factor	120VAC Input, Half Load 230VAC Input, Full Load	0.98 0.97	0.99 0.98		
Input Current	120VAC, Half Load 230VAC, Full Load			13 16	A
Efficiency	120VAC Input, Half Load 230VAC Input, Full Load		92 93		%

Output Parameters	Min	Typ.	Max	Units
Output Voltage	35	48	60	VDC
Output Current Range*	8		40/60	A
Measurement accuracy of DC output voltage		±1		%
Measurement accuracy of DC output current as a percentage of 40A		±5		%
Current Noise & Ripple – Iout (25ºC – 20MHz bandwidth)			±25	% Iout
Turn-on Delay Time – Full Load			5	Sec
Rise Time – Full Load			500	ms

*Note: Maximum output current is 40A for low input voltage, and 60A for high input voltage. (See typical charge curve)

General Specifications

Short Circuit Protection	Hiccup Mode with Self Recovery when fault condition is removed
Over Voltage Protection	Enters auto recovery mode when the static output voltage is between 62V and 72V and the dynamic peak output voltage is below 80V.
Over Temperature Protection	The unit will go into thermal protection when the case temperature exceeds 85 ±10 ºC. The unit will enter hiccup mode and will self-recover when the temperature becomes normal at or below 85 ºC.
Reverse Polarity Protection	Charger has no output voltage when battery polarity reversed.
Battery Under Voltage Protection	Charger has no output if sensed battery voltage is below 30V (±4V).

Temperature Ta (see power derating below -30ºC and above +30ºC)	MIN MAX	-40 +60	ºC
Temperature - Storage	MIN MAX	-40 +85	ºC

|	
Relative Humidity	10% to 90%
Weatherproof	IP66 for Enclosure and fan, IP25 – for the charger connector
Case Size Fan Cooled Liquid Cooled	240mm x 187mm x 70mm (9.45" x 7.36" x 2.76") 240mm x 187mm x 43.5mm (9.45" x 7.36" x 1.71")
Unit Weight	5.25kg (fan version) 4.95kg (Liquid cooling)
Agency Approval	Designed to meet UL2202

Electromagnetic Compatibility EMI/EMC

| Emission:	
EMI, RFI	Designed to meet EN55032 Class B
Immunity:	
EN61000-3-2	Harmonic Current Emission
EN61000-3-3	Voltage Fluctuations and Flicker
EN61000-4-2	ESD 8kV Air Discharge, 4kV Contact Discharge
EN61000-4-3	Radio-Frequency Electromagnetic Field Susceptibility Test-Rs
EN61000-4-4	Electrical Fast Transient/Burst – EFD
EN61000-4-5	Surge Immunity Test, AC power line: line to line 2kV, line to each 4kV
EN61000-4-6	Conducted Radio Frequency Disturbance
EN61000-4-8	Power Frequency Magnetic Field Test
EN61000-4-11	Voltage Dips
EN61547	Electromagnetic Immunity Requirements applies to Lighting Equipment

Charging Curve (Typical):
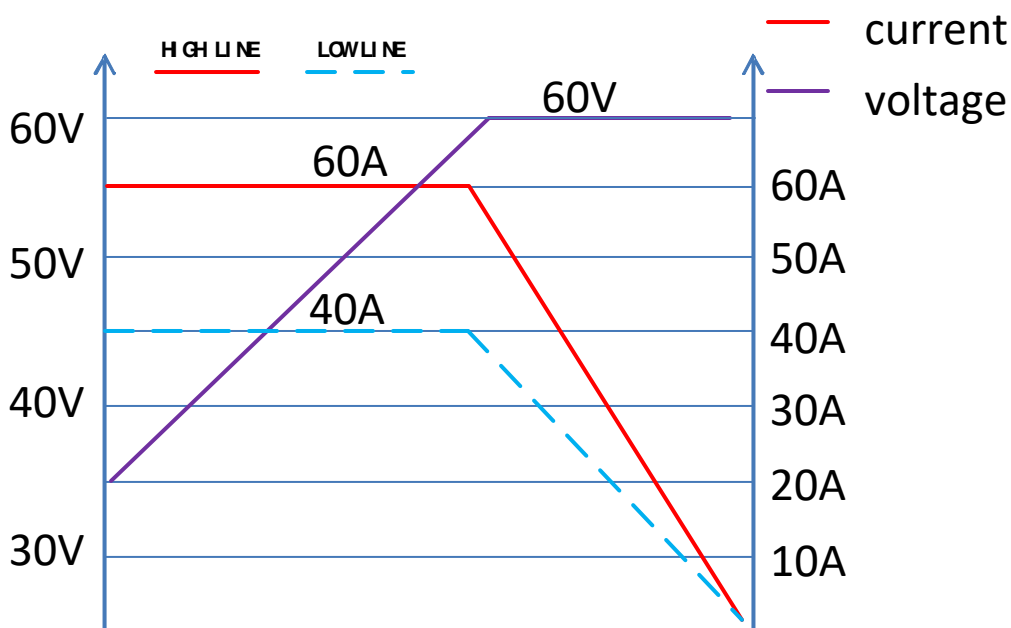
Derating Curve:

Charger will self-regulate output power to prevent overheating and resulting internal damages.
When the case temperature is higher than 75±2°C, the charging current will approximately decrease by 3A step by step.
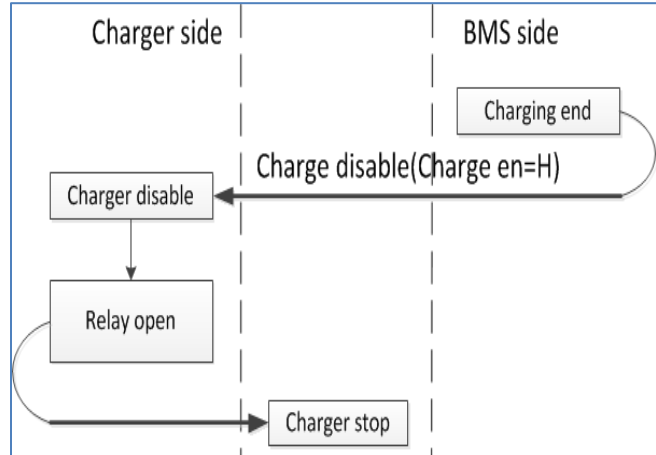
- Charger works with half load with ambient temperatures between -40°C and -30°C.
- Charger returns to work at full load once temperature rises above between -30°C and -25°C.
- Charger has linear derating of output power to 50% from +30°C to +, and no power above +60°C ambient temperature.
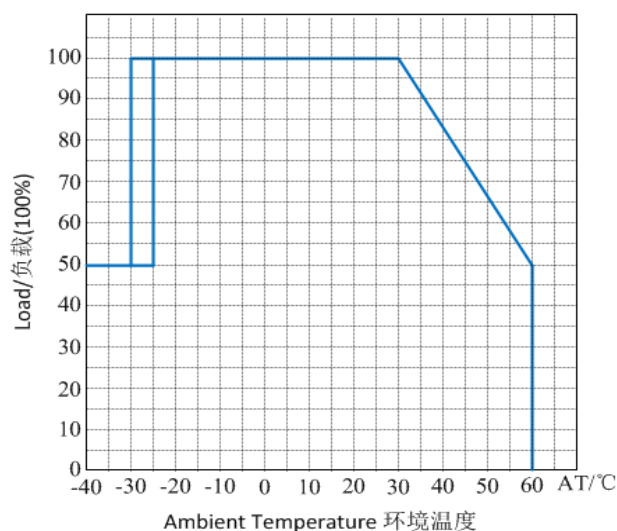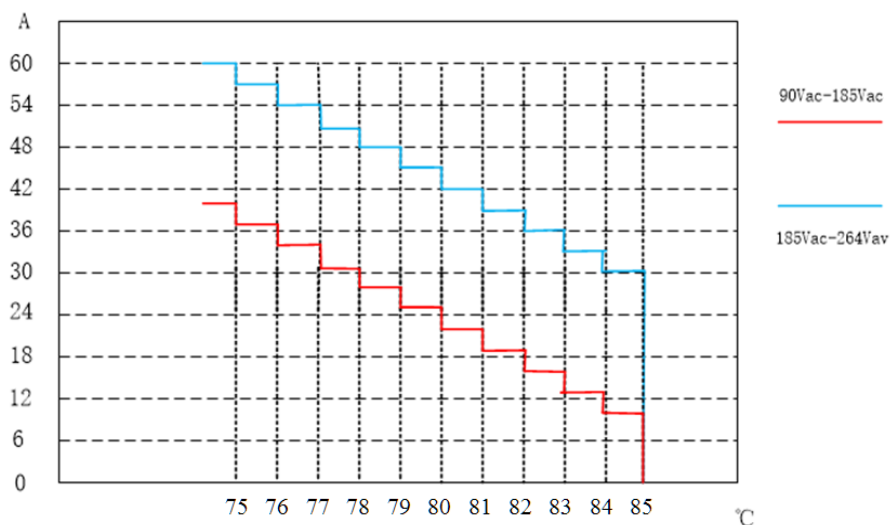
Power-on Timing
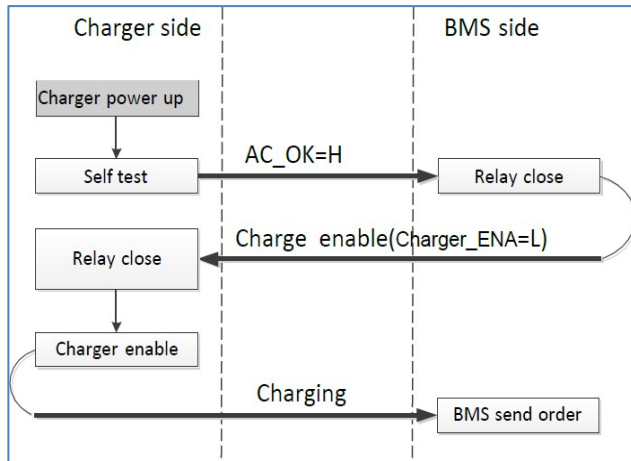
Power-off Timing

Charger Communication:

CANbus type CANopen communication capable, standard CANbus type CANopen and needs to be isolated. Charger will use a CC/CV. Charger should have a CANbus activated charge termination.

The communication is accomplished via CAN 2.0A Interface at 250kbps.

The charger can support bootloader function, so the application code can be flash-able through CAN to bootloader.
The voltage reference of charger can be set in the range of 35 to 60V and through the internal determination it has two different power levels, if input AC voltage is between 90Vac to 185Vac, the max output power is 2400W, and if input voltage is between 177Vac to 264Vac, the max output power is 3500W.

In 3500W power mode, the value of the Charger Power Limit also can be set via CAN communication but must be not greater than 3500W otherwise it is forcibly considered to be 3500W and its current reference of charger can be set in the range of 8 to 60A.
a) If the current reference set by the CAN Frame of Charger control (0x54E or 0x54F) is less than 8A, the current reference is forcibly considered to be 8A.
b) If the current reference set by the CAN Frame of Charger control (0x54E or 0x54F) is greater than 60A, the current reference is forcibly considered to be 60A.

In 2400W power mode, the value of the Charger Power Limit also can be set via CAN communication but must be not greater than 2400W otherwise it is forcibly considered to be 2400W and its current reference of charger can be set in the range of 8 to 40A.
a) If the current reference set by the CAN Frame of Charger control (0x54E or 0x54F) is less than 8A, the current reference is forcibly considered to be 8A.
b) If the current reference set by the CAN Frame of Charger control (0x54E or 0x54F) is greater than 40A, the current reference is forcibly considered to be 40A.

The input AC current is limited to 16 max. (±0.5A) between 90Vac to 264Vac.
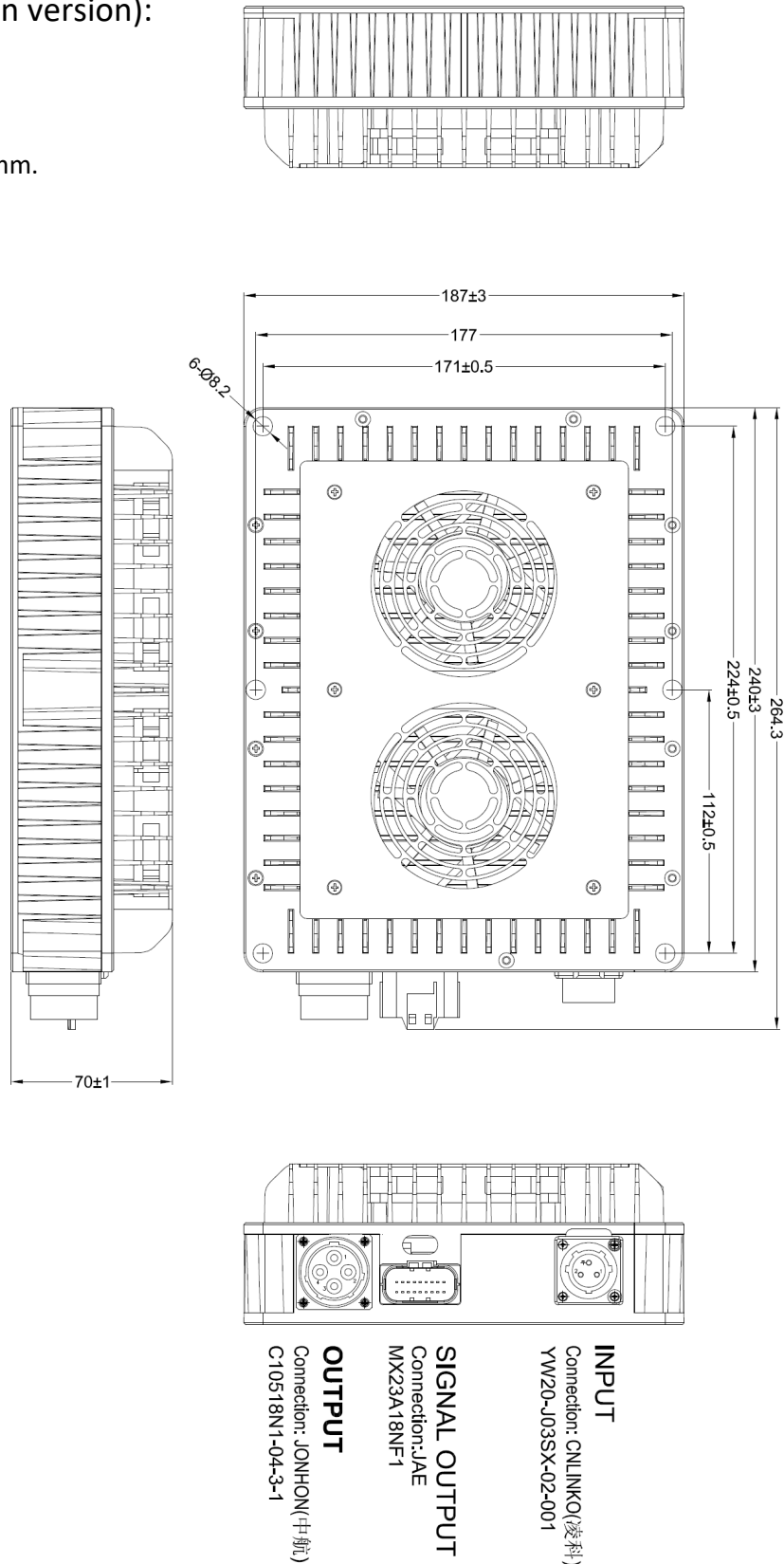
Case Specifications (Fan version):

240mm x 187mm x 70mm
(9.45" x 7.36" x 2.76")
not including connectors;
All below dimensions are in mm.

OUTPUT
Connection: JONHON(中航)
C10518N1-04-3-1

SIGNAL OUTPUT
Connection:JAE
MX23A18NF1

INPUT
Connection: CNLINKO(凌科)
YW20-J03SX-02-001

1.INPUT
CONN: YW20-J03SX-02-001, 凌科电气

CONN.No	DESCRIPTION
1	L
2	N
⏚	PE

2.SIGNAL OUTPUT
CONN:JAE MX23A18NF1

CONN.No	DESCRIPTION	CONN.No	DESCRIPTION
1	Can_H	10	12VIN
2	Can_L	11	SLAVE_CHS
3	NC	12	PE
4	NC	13	PROXIMITY
5	NC	14	PILOT
6	TEST	15	NC
7	5VSB	16	SLAVE_ENA
8	NC	17	CHARGER_ENA
9	ISO_GND	18	12V_ISO

3. OUTPUT:
CONN. C10518N1-04-3-1, 中航

CONN.No	DESCRIPTION
1	VO−
2	VO−
3	VO+
4	VO+

Connector Information:

Type	Socket on Charger	Mating, Plug to Charger (Customer Side)
Input connector	CNLINKO YW20-J03SX-02-001	CNLINKO YW-20-C03PE-02-001 *
Output connector	JONHON C10518N1-04-3-1	JONHON C10518N1-04-1-2 *
Signal connector	JAE MX23A18NF1	JAE MX23A18SF1 *

* Note: Mating connector are not supplied except Output connector which will be provided with samples.
Please consult factory for production volume and supplier information.

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备注：
1. 外观要求：表面无破损、无压伤、无油污等等外观不良，线材外皮每米不能超过3个小凸点
2. 线材规格：H07V-K 6mm²，VDE认证
3. 需符合RoHS法规要求，并提供认证报告
4. IEC线材需通过IEC60332标准的垂直燃烧试验
5. 带X号为重点检验项目，IQC重点检查

剥线镀锡10±1
OD=2.6Max

1.BLUE
2.BLUE
3.RED
4.RED

50±10

热缩套管

①950±10mm
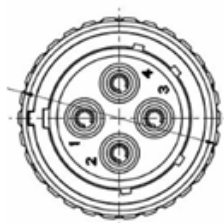
绕2圈，增加PE袋

②接线： 1. 接 H07V-K 6mm² BLACK
2. 接 H07V-K 6mm² BLACK
3. 接 H07V-K 6mm² RED
4. 接 H07V-K 6mm² RED

视图方向A
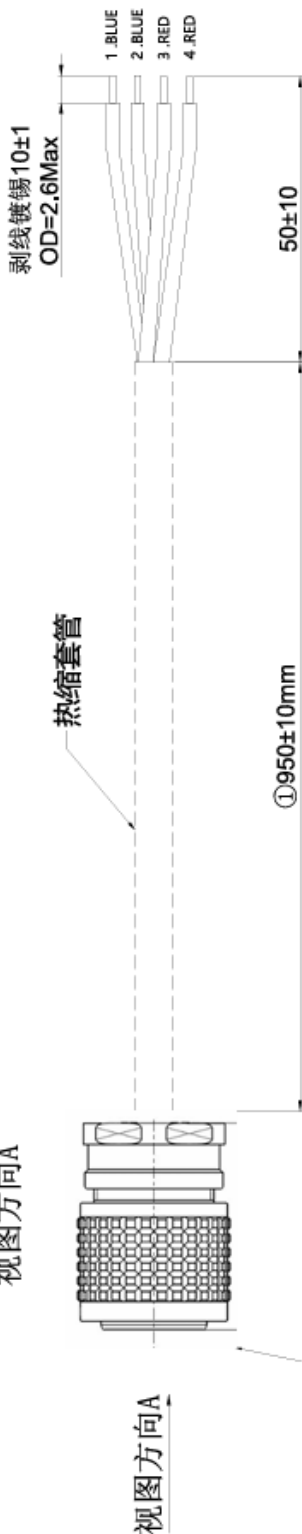
视图方向A

CONN:
C10518N1-04-1-2,
JONHON(中航光电)

Case Specifications (Liquid Cooled Version):

240mm x 187mm x 43.5mm (9.45" x 7.36" x 1.71") not including connectors; All dimensions below are in mm.

Mounting surface

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