

2.4 kWatt Electric Vehicle Li-Ion Charger Data Sheet



Description:

The EVC-2400 Watt 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 Cool or Liquid Cool 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 Number*	Cooling	J1772	Output Power	Maximum Output Current	Voltage Range
EVC-60-2400-FC (PLD2400-EVCS03-48)	Fan Included	No	2400W	40A	35~60V
EVC-60-2400 (PLD2400-EVCS03-48L)	No-Fan Version	No	2400W	40A	35~60V
EVC-60-2400- J1772-J (PLD2400-EVCS03-48LJ)	No-Fan Version	Yes	2400W	40A	35~60V
EVC-60-2400-J1772-FC (PLD3200-EVCS03-48FJ)	Fan Included	Yes	2400W	40A	35~60V

* Model numbers in parenthesis are factory numbers

Specifications:

Input & Output Parameters (All Versions)				
	Min	Typ.	Max	Units
Input Voltage Range (Designed to optimum performance at 115 and 220V nominal lines)	90	115/230	264	VAC
Input Frequency		45 – 65		Hz
Power Factor				
115 VAC Input, Half Load	0.98	0.99		
230 VAC Input, Full Load	0.97	0.98		
Input Current				
115 VAC, Half Load			13	A
230 VAC, Full Load			14	
Efficiency				
115VAC Input, Half Load		92		%
230VAC Input, Full Load		93		
Measurement accuracy of DC output voltage		±1		%
Measurement accuracy of DC output current as a percentage of 40A		±5		%
Current Noise & Ripple – I _{out} (25°C – 20MHz bandwidth)			±25	% I _{out}
Turn-on Delay Time – Full Load			5	Sec
Rise Time – Full Load			500	ms

Output Parameters				
	Min	Typ.	Max	Units
Output Voltage	35	48	60	VDC
Output Current Range	5		40	A

*Note: Maximum output current is 20A for 90Vac to 185Vac input voltage, and 40A for 177Vac to 264Vac input voltage. (See typical charge curve)

General Specifications			
Short Circuit Protection	Hiccup Mode—Self Recovery when fault 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 °C. The unit will enter hiccup mode and will self-recover when the temperature becomes normal at or below 85 °C.		
Reverse Polarity Protection	When the battery polarity is reverse connected the charger will have no output.		
Battery Under Voltage Protection	The charger shall not output if the sensed battery voltage is lower than 30±4V.		
Temperature (50° C to 60° C with power derating)	MIN	-25	°C
	MAX	+60	
Temperature - Storage	MIN	-40	°C
	MAX	+85	

Relative Humidity	10% ~ 90%
Weatherproof	IP66 for Enclosure and fan IP25 – for the charger connector
Case Size (Fan Cool Version)	9.45" x 7.36" x 2.76" 240mm x 187mm x 70mm
Unit Weight	5.23kg (fan version)
Agency Approval	Designed to meet UL2202

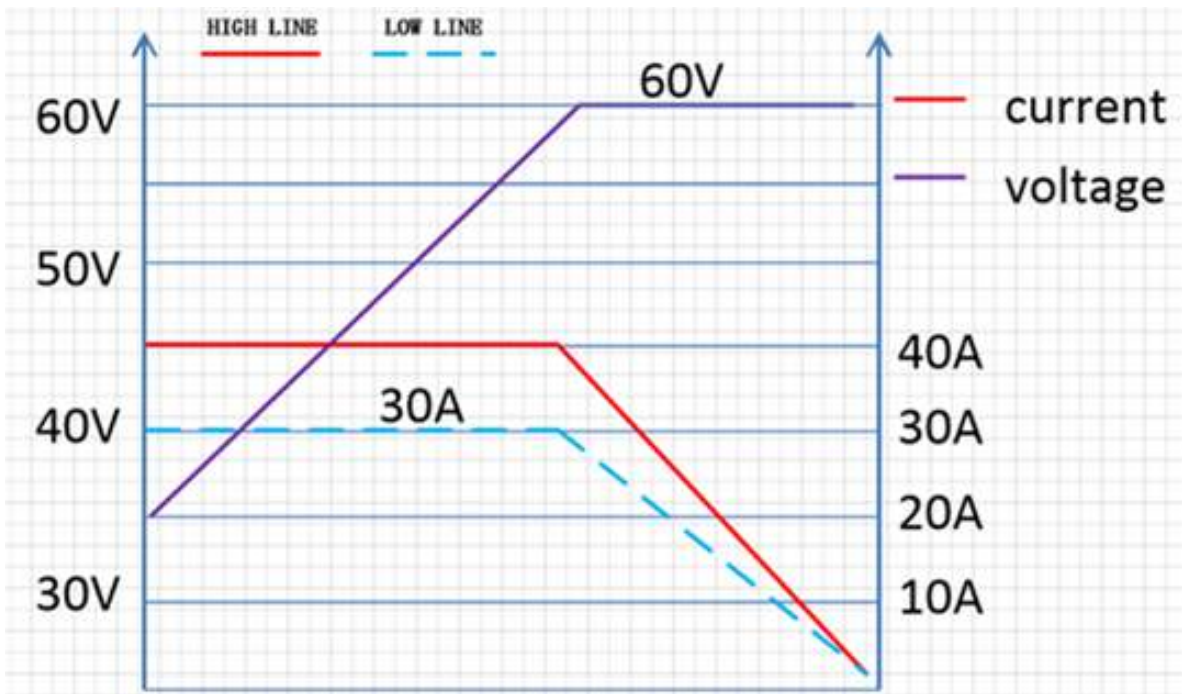
Electromagnetic Compatibility EMI/EMC

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

Notes:

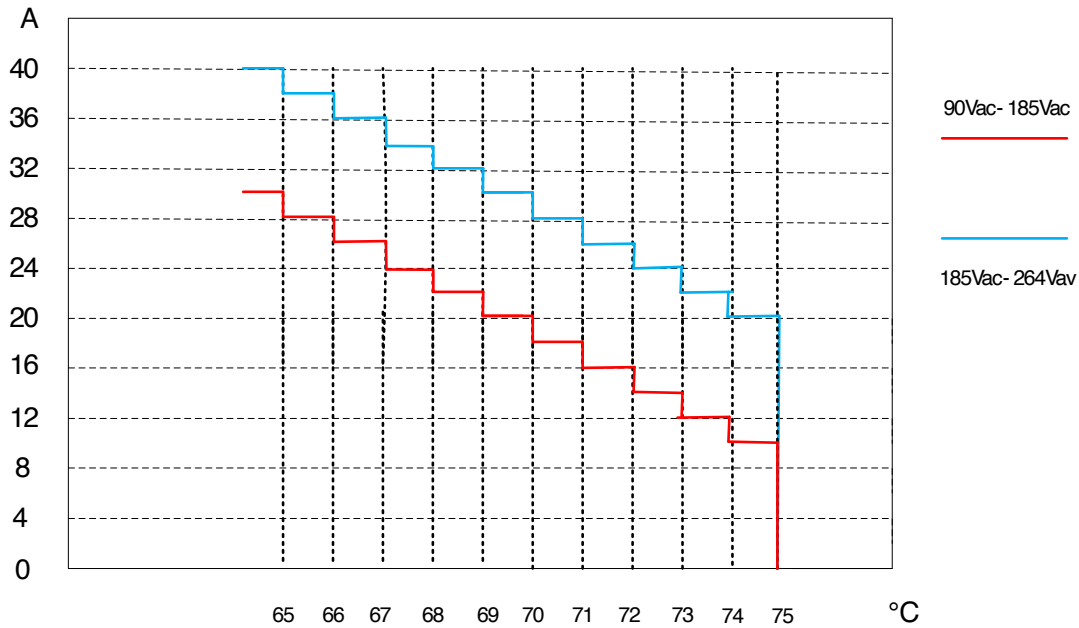
- (1) Specification is subject to change without notice.

Charging Curve (Typical):

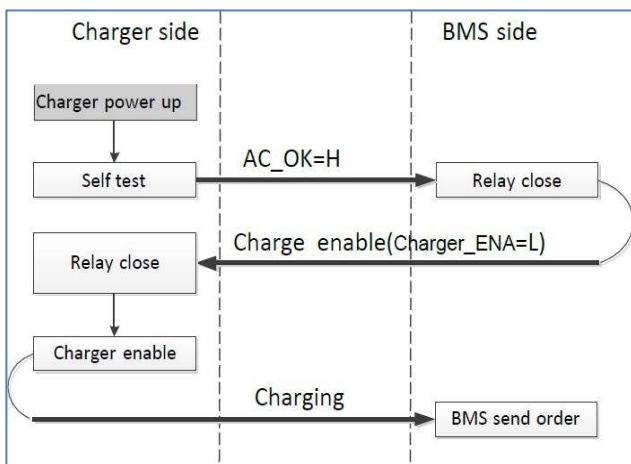


Derating Curve:

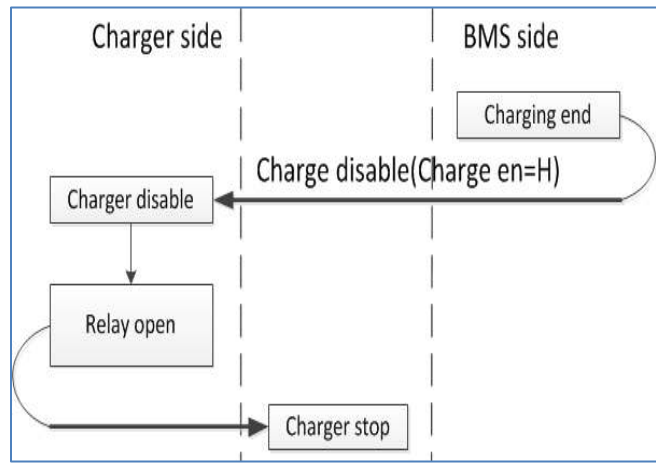
Charger will self-regulate output power to prevent overheating and resulting internal damages. When the case temperature is higher than $75\pm 2^{\circ}\text{C}$, the charging current will approximately decrease by 2A step by step.



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 1800W, and if input voltage is between 177Vac to 264Vac, the max output power is 2400W.

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 5 to 40A.

- a) If the current reference set by the CAN Frame of Charger_control (0x54E or 0x54F) is less than 5A, the current reference is forcibly considered to be 5A.
- 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.

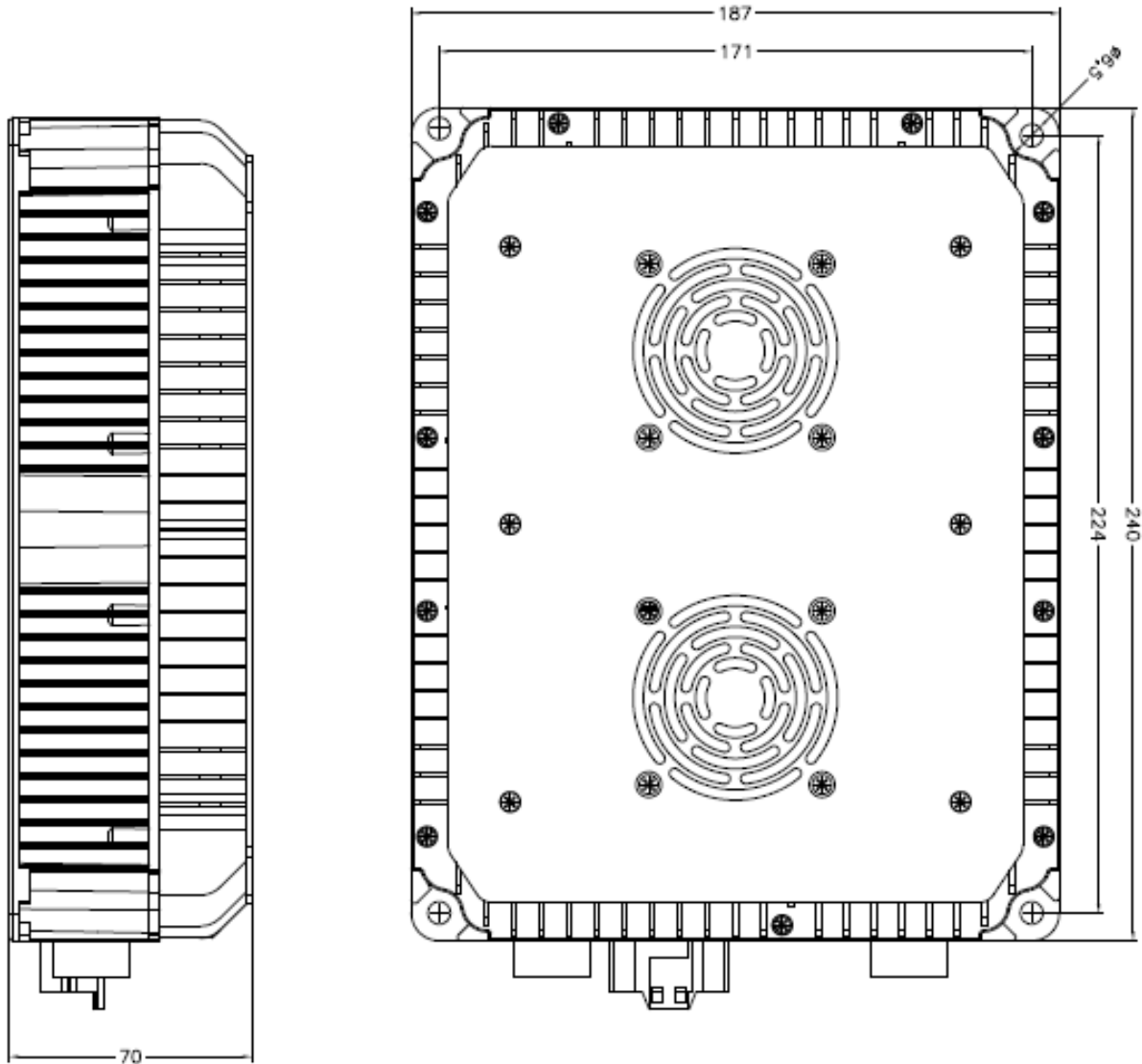
In 1800W power mode, the value of the Charger Power Limit also can be set via CAN communication but must be not greater than 1800W otherwise it is forcibly considered to be 1800W and its current reference of charger can be set in the range of 5 to 30A.

- a) If the current reference set by the CAN Frame of Charger_control (0x54E or 0x54F) is less than 5A, the current reference is forcibly considered to be 5A.
- b) If the current reference set by the CAN Frame of Charger_control (0x54E or 0x54F) is greater than 30A, the current reference is forcibly considered to be 30A.

The input AC current is limited to $14 \pm 0.5A$ between 90Vac to 264Vac.

Case Specifications (Fan version):

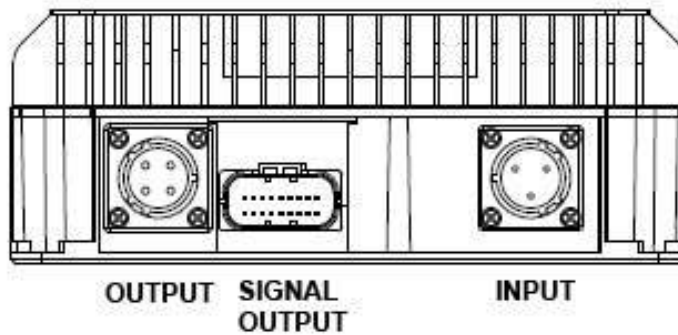
240mm x 187mm x 70mm (9.45" x 7.36" x 2.76") not including connectors; All below dimensions are in mm.



Output Connector: CNLINKO
YW20-J04SX-02-001

Signal Connector: JAE
MX23A18NF1

Input Connector: CNLINKO
YW20-J03SX-02-001



Case Connections:

Type	Socket on Charger	Plug to Charger (Not Supplied)
Input connector	CNLINKO YW20-J03SX-02-001	CNLINKO YW-20-C03PE-02-001
Output connector	CNLINKO YW20-J04SX-02-001	CNLINKO YW-20-C04PE-03-002
Signal connector	JAE MX23A18NF1	JAE MX23A18SF1

Output Pins: (All Output Voltage Versions):

Input Connector: CNLINKO YW20-J03SX-02-001		Output Connector: CNLINKO YW20-J04SX-02-001
Pin	Function	Function
1	L	VO-
2	N	VO-
3	Not applicable	VO+
GND	PE	VO+

Signal Pins (Connector: JAE MX23A18NF1):

Pin	Function
1	CAN_H1
2	CAN_L1
3	Not Connected
4	Not Connected
5	Not Connected
6	Test for Factory
7	+5VSB
8	Not connection
9	ISO_GND1
10	Not Connected or 12Vin (For J1772)
11	Not Connected or Slave_ENA1(For J1772)
12	Not Connected or PE (For J1772)
13	Not Connected or PROXIMITY (For J1772)
14	Not Connected or PILOT (For J1772)
15	Not Connected
16	Slave_ENA
17	CHARGE_ENA
18	12V_ISO1

Output connector/cable (Customer must order separately):

备注:
1. 拉力试验: 整条线拉力≥15KG (1分钟无断芯和延伸率≤总长的8%)
2. 外观要求: 表面无破损, 无压伤, 无油污等外观不良, 线材外皮每米不能超过3个小凸点
3. 线材规格: UL1005 14AWG
4. 需符合RoHS法规要求, 并提供认证报告
5. UL线材符合UL1581标准VW-1等级

接线: 1. 接 UL 1015 14#AWG BLUE
2. 接 UL 1015 14#AWG BLUE
3. 接 UL 1015 14#AWG RED
4. 接 UL 1015 14#AWG RED

热缩套管


10±1

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

950±10mm

50±10

3 CONN:
YW-20-C04PE-03-002,
凌科



绕2圈, 增加PE袋

TOL±	RANGE	NCT	TOL	OTH	PAK	WIR	JIG	
0~$=6$	0.25	0.20	0.20	1.00	2.00	0.10		
6~<math><30</math>	0.25	0.20	0.35	1.00	3.00	0.10		
30~<math><120</math>	0.30	0.25	0.45	2.50	5.00	0.15		
120~<math><300</math>	0.45	0.30	0.80	3.50	8.00	0.20		
300~<math><600</math>	0.60	0.50	0.80	4.50	10.00	0.30		
600~<math><1200</math>	1.00	0.80	1.00	5.50	15.00	0.40		
ANG. TOL.	1°						0.5°	

03	4CF0000050DR2版本升级, 修改端子料号	12/18/20
02	4CF0000050DR1版本升级, 增加PE袋	08/02/19
01	ORIGINAL RELEASE	04/18/18
REV.	DESCRIPTION	DATE

POWERLAND 南京博兰德电子科技有限公司
Powerland Technology Inc.

TITLE/PART NAME: OP WIRE APPROVED

PART NO.: 4CF0014000QDR3 CHECKED

MODEL: PLD3400-EVCS02-122 DESIGNED shenyue

SCALE: 1:1 UNIT: mm

Input connector/cable (Customer must order separately):

备注:
1. 拉力试验: 整条线拉力≥15KG (1分钟无断芯和延伸率≤总长的8%)
2. 外观要求: 表面无破损, 无压伤, 无油污等外观不良, 线材外皮每米不能超过3个小凸点
3. 线材规格: UL SJTW 14WG*3C, 外被棕色, 黑屏蔽
额定温度: 105℃, 额定电压: 300V
4. 需符合RoHS法规要求, 并提供认证报告
5. UL线材符合UL1581标准VW-1等级

增加PE袋和扎带, 扎带不可有划痕

190Max

190Max

视图方向

GREEN绿
BLACK黑
WHITE白

接线: 标示 "1" 接 黑色
标示 "2" 接 白色
标示 "3" 接 绿色

CONN:
YW-20-C03PE-02-001,
凌科

09.25±0.2

10±1
剥线镀锡OD=2.4Max

WHITE白
BLACK黑
GREEN绿

*900±10

100±5

TOL±	RANGE	NCT	TOL	OTH	PAK	WIR	JIG	
0~$=6$	0.20	0.20	0.20	1.00	2.00	0.10		
6~<math><30</math>	0.25	0.20	0.35	1.00	3.00	0.10		
30~<math><120</math>	0.30	0.25	0.45	2.50	5.00	0.15		
120~<math><300</math>	0.45	0.30	0.80	3.50	8.00	0.20		
300~<math><600</math>	0.60	0.50	0.80	4.50	10.00	0.30		
600~<math><1200</math>	1.00	0.80	1.00	5.50	15.00	0.40		
ANG. TOL.	1°						0.5°	

02	4CF0015000QDR1版本升级, 增加PE袋	08/02/19
01	ORIGINAL RELEASE	04/18/18
REV.	DESCRIPTION	DATE

POWER GROUP 南京博兰德电子科技有限公司
POWERLAND FSP-Powerland Technology Inc.

TITLE/PART NAME: OP WIRE APPROVED

PART NO.: 4CF0015000QDR2 CHECKED

MODEL: PLD3400-EVCS02-122 DESIGNED shenyue

SCALE: 1:1 UNIT: mm