

# 120W Factory Programmable EV Charger Data Sheet



## Description:

The EVC-AA-120-XXYYYY is a 120 Watt, constant power, factory programmable charger for use in charging Lithium ion and other chemistry battery systems used in Electric Vehicles. The charger can be programmed to the customer's current/voltage requirements up to 120 Watts of power. See table below for available ranges.

## Features:

- Universal AC Input / Full Range
- 90 - 305 VAC Input
- High Reliability
- Efficiency up to 89%
- Power Factor up to 0.98 min @ 110 VAC Full Load
- Over Voltage Protection
- Short Circuit Protection
- Over Temperature Protection
- Open Circuit Protection
- Waterproof IP67 Enclosure
- RoHS Compliant
- 2 Year Warranty
- Fully potted to ensure high reliability in rugged environments



Model Number	Programmable Output Charging Current Range	Voltage Range
EVC-24-120-XXYYYY*	3800 mA to 4200 mA	15 V - 30 V
EVC-36-120-XXYYYY*	2527 mA to 2793 mA	22.5 V - 45 V
EVC-48-120-XXYYYY*	1938 mA to 2142 mA	29 V - 58.8 V

\*XXYYYY specifies nominal programmable Voltage (XX) based on the nominal output charging current (YYYY)

## Specifications:

### Input Parameters

	Min	Typ	Max	Units
Input Voltage Range* *Designed to optimum performance at 110 and 220 nominal lines	90	110	305	VAC
Input Frequency		47 – 63		Hz
Power Factor 110 VAC Input, Full Load 230 VAC Input, Full Load	0.98 0.95			
Input Current 110 VAC, Continuous 230 VAC, Continuous			1.5 0.75	A RMS
Efficiency 115 VAC Full Load 230 VAC Full Load		86 89		%

### 24V Output Parameters

	Min	Typ	Max	Units
24V Charging Current Setting	3800	4000	4200	mA
24V Charging Voltage Range	15		30	V
The output charging current can be programmed between 3800mA and 4200mA, while the maximum output voltage increases up to 30V accordingly based on the principle of 120W maximum output power.				
Output Overshoot/Undershoot (Power On/Off) Overshoot (output peak current) 5.6A maximum @ nominal AC input, full load, 25°C. Measured with 20MHz bandwidth.				

### 36V Output Parameters

	Min	Typ	Max	Units
36V Charging Current Setting	2527	2660	2793	mA
36V Charging Voltage Range	22.5		45	V
The output charging current can be programmed between 2527mA and 2793mA, while the maximum output voltage increases up to 45V accordingly based on the principle of 120W maximum output power.				
Output Overshoot/Undershoot (Power On/Off) Overshoot (output peak current) 5.6A maximum @ nominal AC input, full load, 25°C. Measured with 20MHz bandwidth.				

#### 48V Output Parameters

	Min	Typ	Max	Units
48V Charging Current Setting	1938	2040	2142	mA
48V Charging Voltage Range	29		58.8	V
The output charging current can be programmed between 1938mA and 2142mA, while the maximum output voltage increases up to 58.8V accordingly based on the principle of 120W maximum output power.				
Output Overshoot/Undershoot (Power On/Off)				
Overshoot (output peak current) 5.6A maximum @ nominal AC input, full load, 25°C. Measured with 20MHz bandwidth.				

#### All Models

	Min	Typ	Max	Units
Current Accuracy			±5	%
Voltage Accuracy			±2	%
Output Power			120	W
Ripple and Noise - I <sub>out</sub> with typical CV load at 25 °C 100-240 VAC input measured at 20MHz bandwidth			20	% I <sub>out</sub>
Turn-on Delay Time Full Load @ 110 VAC Full Load @ 230 VAC			2	S
Rise Time @ 25°C, Full Load			150	mS
Current Temperature Coefficient 0°C < T <sub>case</sub> < T <sub>max</sub>			0.05	% / °C
Voltage Temperature Coefficient 0°C < T <sub>case</sub> < T <sub>max</sub>			0.05	% / °C
Isolation Test - Primary to Secondary	3750 VAC 10 mA Max / 60 seconds (3 seconds for production)			
Isolation Test - Primary to Ground	1875 VAC 10 mA Max / 60 seconds (3 seconds for production)			
Isolation Test - Secondary to Ground	500 VAC 10 mA Max / 60 seconds (3 seconds for production)			
Leakage Current: @240VAC / 50 Hz	0.50 mA Max			
	Min	Typ	Max	Units
Ground Resistance: @ 25A, 1 minute			0.1	Ω
Isolation Resistance - Primary to Secondary with 500 VDC test voltage	100			MΩ

MTBF: (MIL-HDBK-217F, 25°C. 230VAC input and full load output)	$\geq 200,000$		Hours	
Life Time: @ 50°C, 230VAC input and full load output	$\geq 50,000$		Hours	
	Min	Typ	Max	Units
Temperature - Operating	-20		+60	°C
Temperature - Storage	-40		+85	°C
Relative Humidity	10% - 100 %			
Weatherproof	IP64 Enclosure			
Case Size	10.75" x 1.93" x 1.59" 273mm x 49mm x 40.5mm			
Unit Weight	0.8 kg			
Agency Approval	Designed to meet CE and UL1012			

<b>Protection</b>	
Short Circuit Protection	Auto Recovery - return to normal when fault condition is removed
Over Voltage Protection	Can be programmed at 3-5V over maximum voltage output. Auto-recovery during over voltage protection and will return to normal operation when fault condition is removed.
Over Temperature Protection	The unit will go into thermal protection when it is overheating. The unit will enter auto-recover mode and will self-recover when the temperature becomes normal.
Open Circuit Protection	When output is open, power supply will enter auto-recovery and return to normal operation after fault condition is removed.

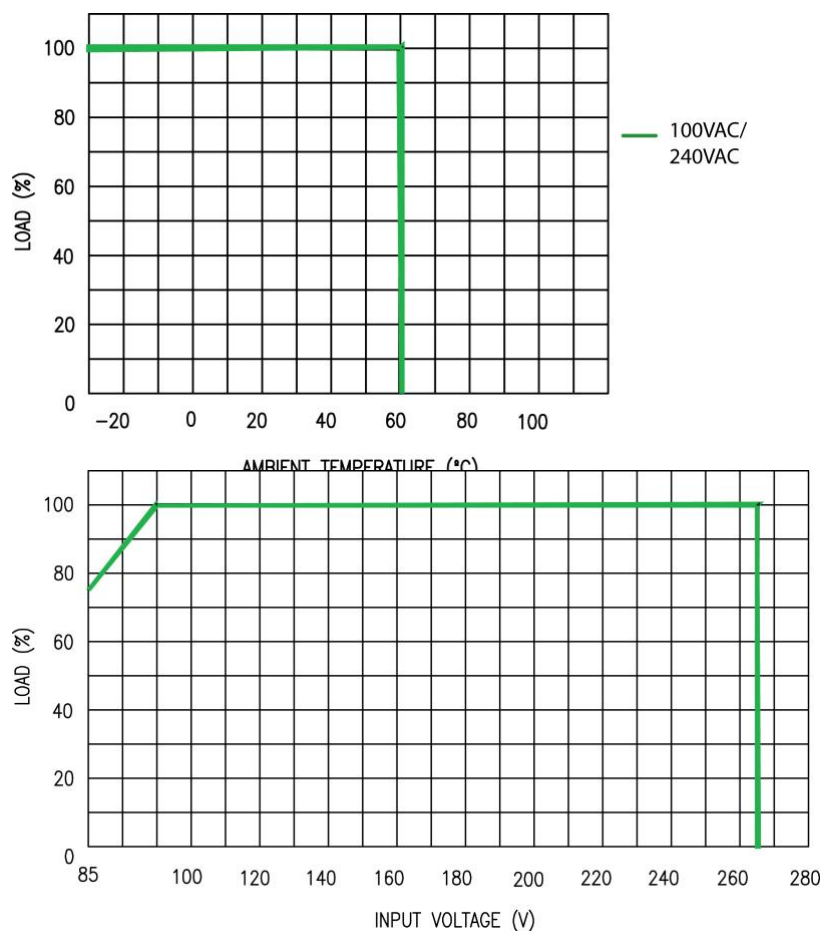
### Notes:

- (1) When the output voltage is less than set maximum voltage, charger will be in CC mode. When the output voltage reaches and is above  $\pm 2\%$  of the set maximum voltage, the charger will be in CV mode.
- (2) Vibration - 10 to 300 Hz sweep at a constant acceleration of 1.0G (Breadth; 3.5mm) for 1 hour for each of the perpendicular axes X, Y, Z.
- (3) Specification is subject to change without notice.

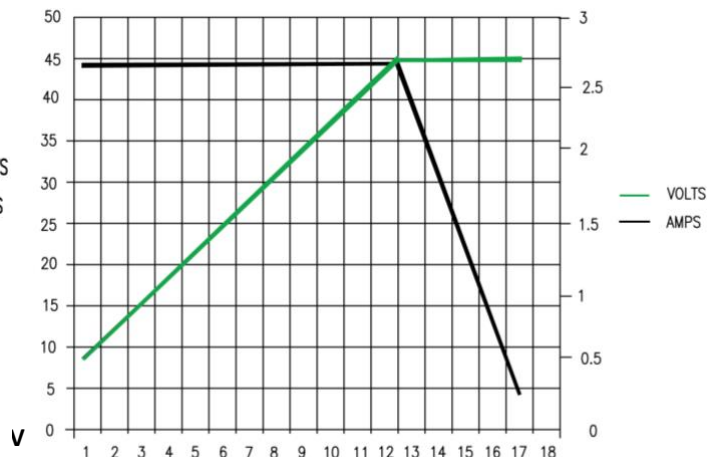
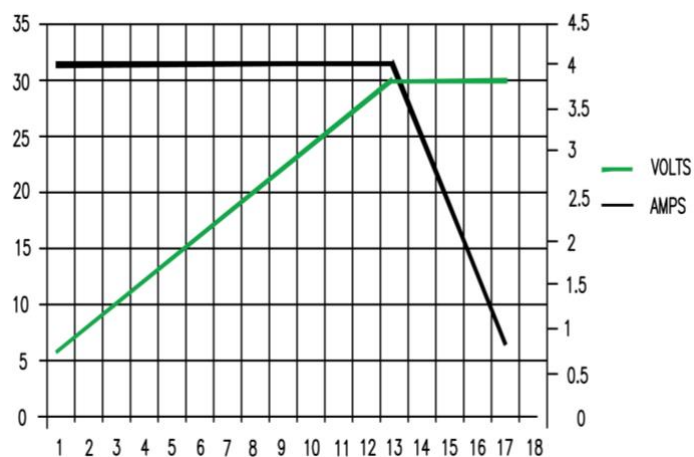
### Electromagnetic Compatibility EMI/EMC

EMI	Comply with EN55002 Class B
<b>Immunity</b>	
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

### Derating Curves:

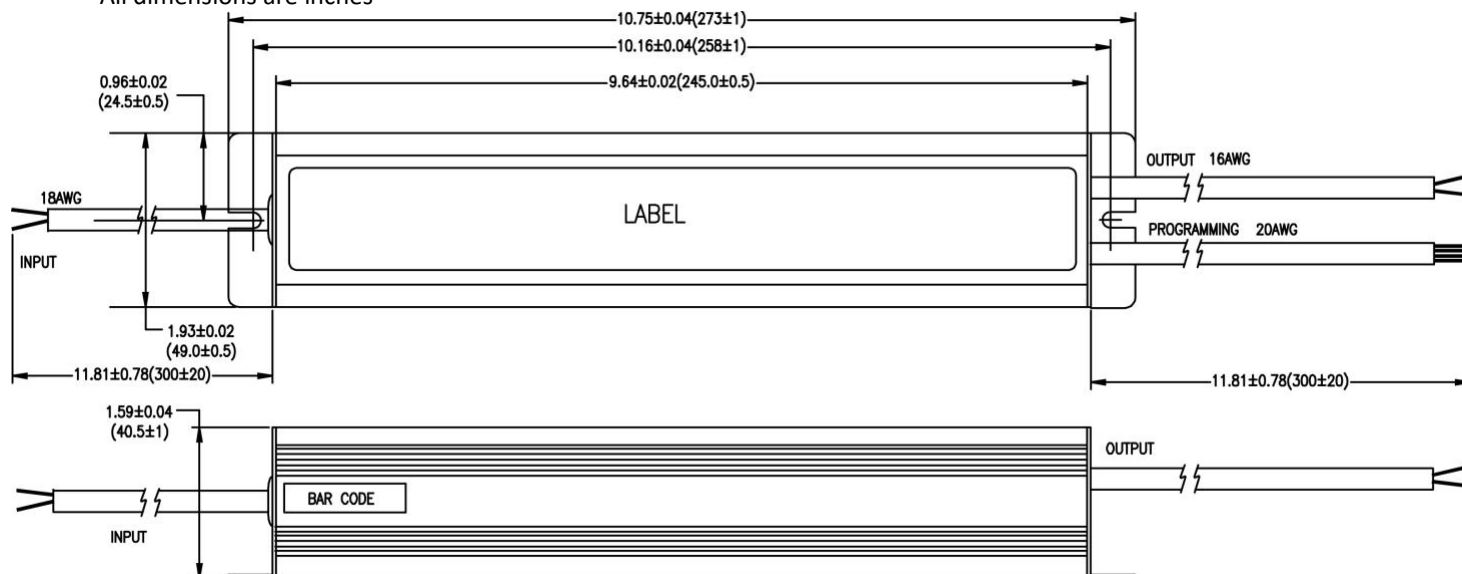


## Charging Curves:



## Case Specifications:

All dimensions are inches



Wiring Table			
	Color	Function	
Input	Blue Brown Gr/Y	Neutral Line Ground	
Output	Black Red	Vo- Vo+	
Programming	Orange + White -	Programming	Red LED (See Below)
	Grey + Purple -	Programming	Green LED (See Below)

**NOTE:**

4-Wire programming/indication cable is for programming the charging profile. After programming, it can be used for the indication of 2 charge status LEDs. First LED in Red (if connected on customer's application) will show the charger is charging in the CC and will continue to stay on as the charger goes into the final CV charge mode. The second LED in Green (if connected on customer's application) will come on when the charge is complete if defined at the < 50mA being absorbed by the battery state.