3.4kW Electric Vehicle Li-Ion Charger Data Sheet

ROHS COMPLIANT

Description:

The EVC-3400-Watt Series supports 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 onboard charging of Electric Vehicles and battery systems contained within them.

Features:

- Universal AC (90~264Vac) Input
- High Reliability
- Communications via CAN Bus
- Fan or Cold-plate Cooling Options
- Efficiency Up to 93%
- Fully Encapsulated
- Over Voltage Protection
- Short Circuit Protection
- Over Temperature Protection
- Reverse Polarity Protection
- Waterproof IP66 Enclosure
- J1772 Options
- Two Output Voltage Ranges Available from 55~122V

Model Selection Table

AC Input Voltage	DC Output Power	DC Output Voltage	DC Output Current	Efficiency (typ.)	Cooling	Model Number (factory number)	J1772
90 – 264V	3400W @ 230Vin 1700W @ 120Vin	55 – 84V	40A @ 230Vin 20A @ 120Vin	93% @ 230Vin 92% @ 120Vin	**Fan** cooling	**EVC-84-3400-FC** (PLD3400-EVCS02-84)	No
						EVC-84-3400-J1772-FC (PLD3400-EVCS02-84FJ)	Yes
					Cold-plate mounting	**EVC-84-3400** (PLD3400-EVCS02-84L)	No
						EVC-84-3400-J1772-J (PLD3400-EVCS02-84LJ)	Yes
90 – 264V	3400W @ 230Vin 1700W @ 120Vin	70 – 122V	34A @ 230Vin 17A @ 120Vin	93.5% @ 230Vin 92.5% @ 120Vin	**Fan** cooling	**EVC-122-3400-FC** (PLD3400-EVCS02-122F)	No
					Cold-plate mounting	**EVC-116-3400** (PLD3400-EVCS02-122)	No

Specifications:

Note: Specification is subject to change without notice.

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 (70~122Vo) 115 VAC Input, Half Load (55~84Vo) 230 VAC Input, Full Load (70~122Vo) 230 VAC Input, Full Load (55~84Vo)	 0.98 0.98 0.97 0.97	 0.99 0.99 0.98 0.98		
Input Current 115 VAC, Half Load 230 VAC, Full Load			 13 16	 A
Efficiency 115VAC Input, Half Load (70~122Vo) 115VAC Input, Half Load (55~84Vo) 230VAC Input, Half Load (70~122Vo) 230VAC Input, Half Load (55~84Vo)		 92.5 92 93.5 93		 %
Measurement Precision DC Output Voltage		±1		%
Measurement Precision DC Output Current		±5		%
Current Noise & Ripple – Iout (25ºC – 20MHz bandwidth)			±25	% Iout
Turn-on Delay Time – Full Load			5	Sec
Rise Time – Full Load			500	ms

Output Parameters (70V – 122V Versions)	Min	Typ.	Max	Units
Output Voltage	70	116	122	VDC
Output Current Range*	5		34	A

**Note: Maximum output current is 17A for 90Vac to 185Vac input voltage, and 34A for 177Vac to 264Vac input voltage. (See typical charge curve)*

Output Parameters (55V – 84V Versions)	Min	Typ.	Max	Units
Output Voltage	55	72	84	VDC
Output Current Range*	5		40	A

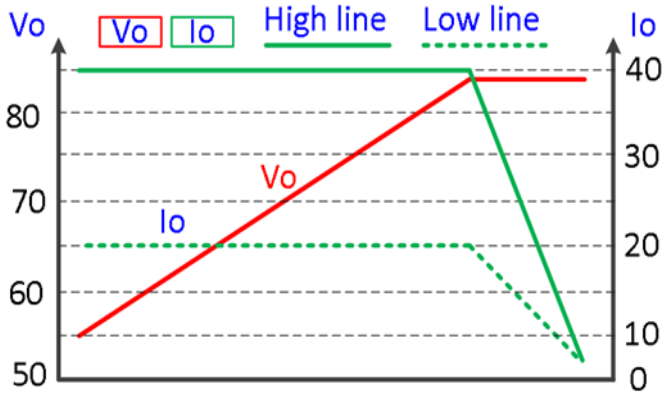
**Note: Maximum output current is 20A for 90Vac to 185Vac input voltage, and 40A for 177Vac to 264Vac input voltage. (See typical charge curve)*

General Specifications			
Short Circuit Protection	Hiccup Mode with Self Recovery when fault is removed		
Over Voltage Protection (Output 70V – 122V)	Auto recovery mode activates when output voltage reaches 125 to 130V. The unit returns to normal operation when input power is recycled.		
Over Voltage Protection (Output 55V – 84V)	Auto recovery mode activates when output voltage is higher than 87V. The unit will return to normal operation when input power is recycled.		
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 with battery polarity reversed.		
MTBF: @ 25ºC, Full Load, Nominal Input	≥ 200,000 Hours		
Product Life @ 50 ºC	≥ 30,000 Hours		
Temperature - Operating	MIN MAX	-40 +60	ºC
Temperature - Storage	MIN MAX	-40 +85	ºC
Relative Humidity	10% ~ 90%		
Weatherproof	IP66 for Enclosure, fan, and signal connector		
Case Size (Fan Cool Version)	9.45” x 7.36” x 2.76” 240mm x 187mm x 70mm		
Case Size (Cold-plate Cooling Version)	240mm x 187mm x 43.5mm 9.45” x 7.36” x 1.71”		
Unit Weight	5.2kg (fan version) 4.9kg (Cold-plate cooling)		
Agency Approval	Designed to meet UL2202		

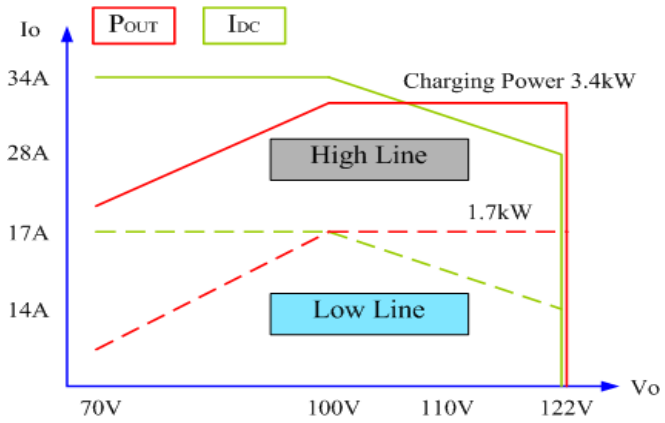
Electromagnetic Compatibility EMI/EMC	
EMI, RFI	Designed to meet EN55032 Class B
Immunity:	
EN61000-3-2	Harmonic Current Emission
EN61000-3-3	Voltage Fluctuations and Flicker
EN61000-4-2	ESD 8kV Air Discharge, 4kV Contact Discharge
EN61000-4-3	Radio-Frequency Electromagnetic Field Susceptibility Test-Rs
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

Charging Curves (Typical):

55~84Vo Version

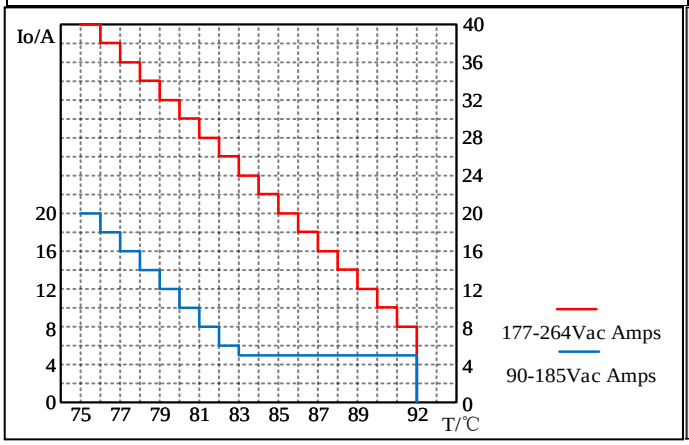
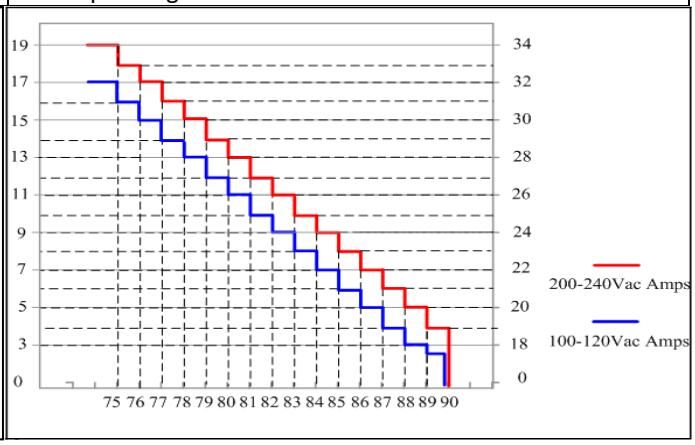


70~122Vo Version



Derating Curves:

Charger will self-regulate output power to prevent overheating and resulting internal damages. When the case temperature is higher than 75°C, the charging current will decrease by 1A step by step.

55~84Vo Version	70~122Vo Version
Y axis is the output current for both high input voltage and low input voltage.	The left Y axis shows the output current for the low input voltage, corresponding to the blue waveform. The right Y axis shows the output current for the high input voltage, corresponding to the red waveform
	

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.

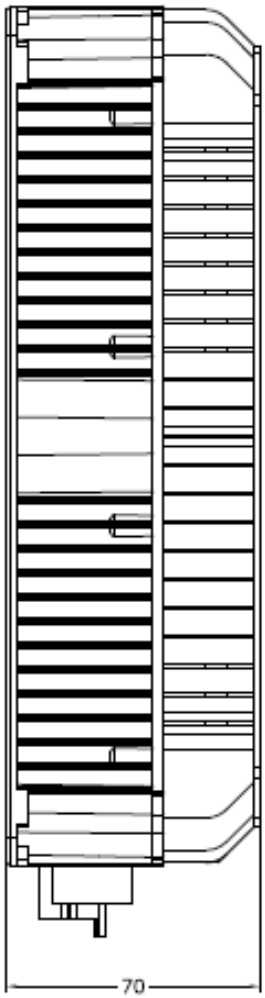
The communication is accomplished via CAN 2.0A/2.0B Interface at 500kbps. The charger can support bootloader function, so the application code can be flash-able through CAN to bootloader.

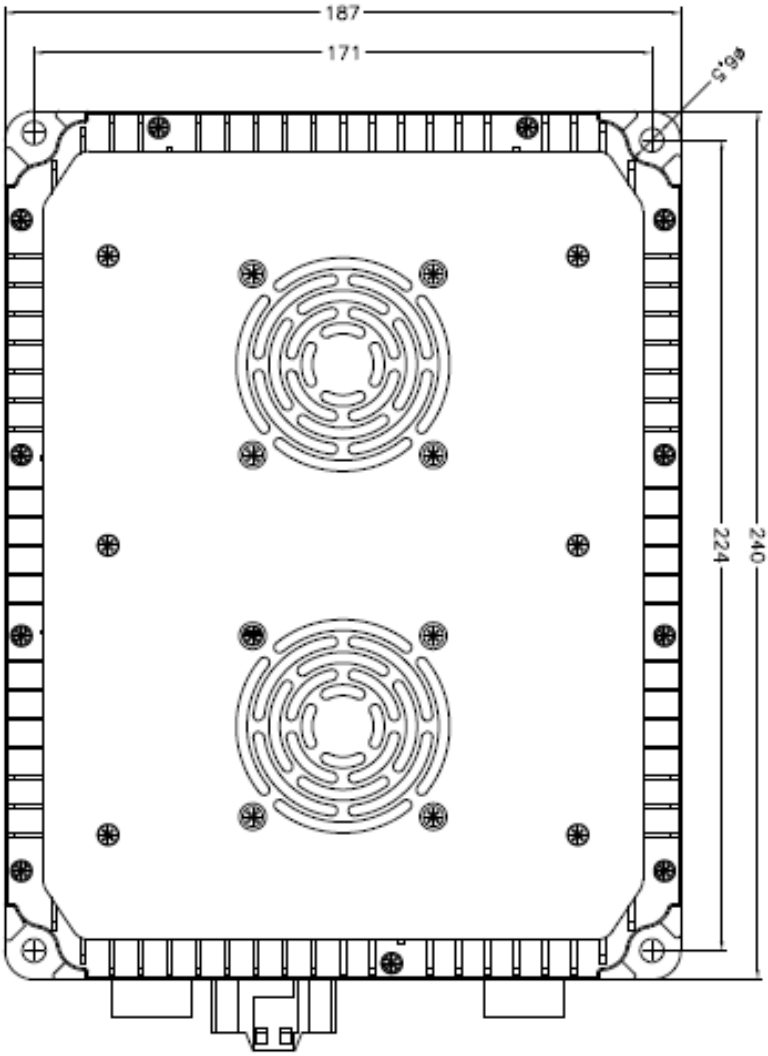
The voltage reference of charger can be set in the range of 55 to 84V or 70~122 depending on the version. Through internal determination, if input AC voltage is between 90Vac to 185Vac, the max output power is 1700W, and if input voltage is between 177Vac to 264Vac, the max output power is 3400W.

In 3400W power mode, the value of the Charger Power Limit also can be set via CAN communication but must be not greater than 3400W otherwise it is forcibly considered to be 3400W and its current reference of charger can be set in the range of 5 to 40A.

Mechanical Case Specifications for Fan version:

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

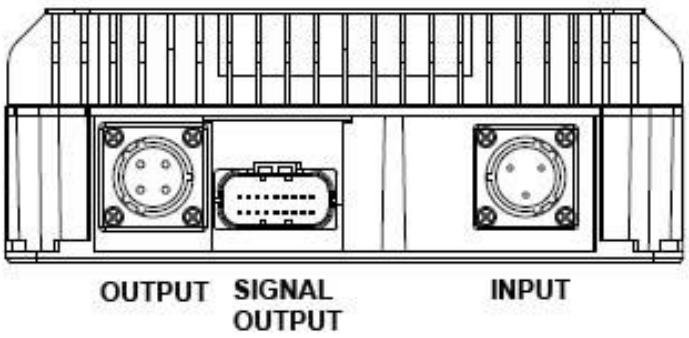




Output Connector: CNLINKO YW20-J04SX-02-001

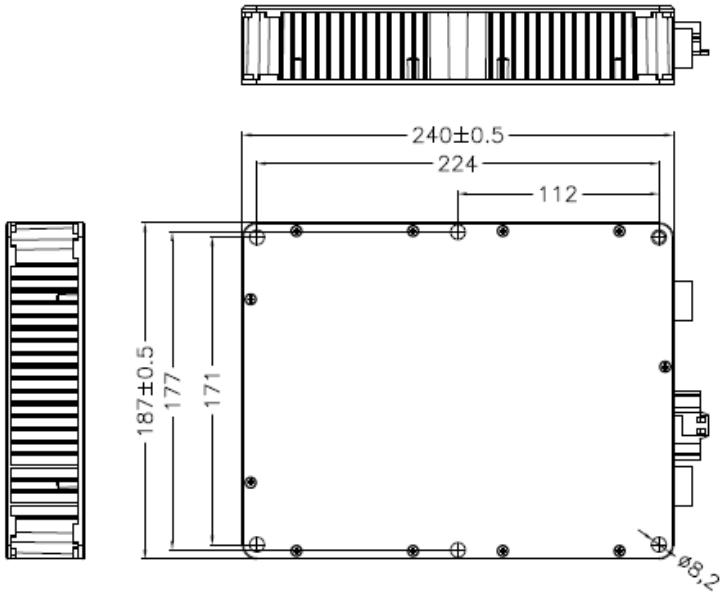
Signal Connector: JAE MX23A18NF1

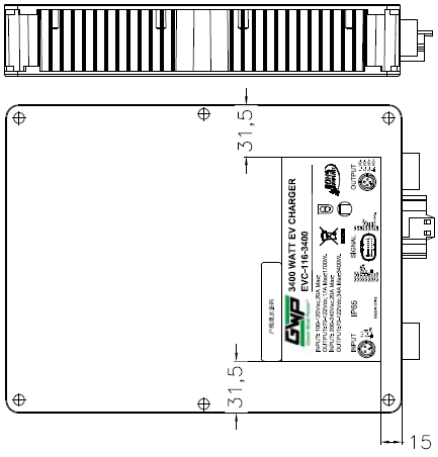
Input Connector: CNLINKO YW20-J03SX-02-001

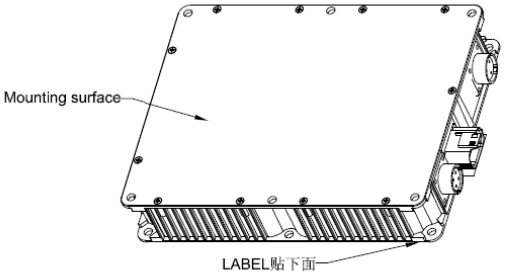


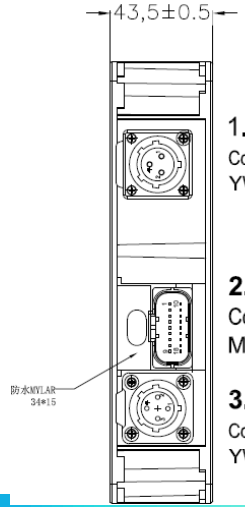
Mechanical Case Specifications for Cold plate mounting Version:

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









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

2.SIGNAL OUTPUT
Connection:JAE
MX23A18NF1

3.OUTPUT
Connection: CNLINKO(凌科)
YW20-J04SX-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	NC	10	AC_OK
2	NC	11	AC_OK
3	NC	12	Chargar_ENA
4	Can_Gnd	13	12V_ISO_GND
5	Can_5V	14	12V_ISO
6	Can_L	15	DGND
7	Can_H	16	BKGD/MS
8	Test For Factory	17	Reset
9	NC	18	+5VSB

3, **OUTPUT:**
CONN. YW20-J03SX-02-001,凌科电气

CONN.No	DESCRIPTION
1	VO-
2	VO-
3	VO+
⏚	VO+

Connector Specifications: Input, Output and Signals

Type	Socket on Charger	Customer side 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

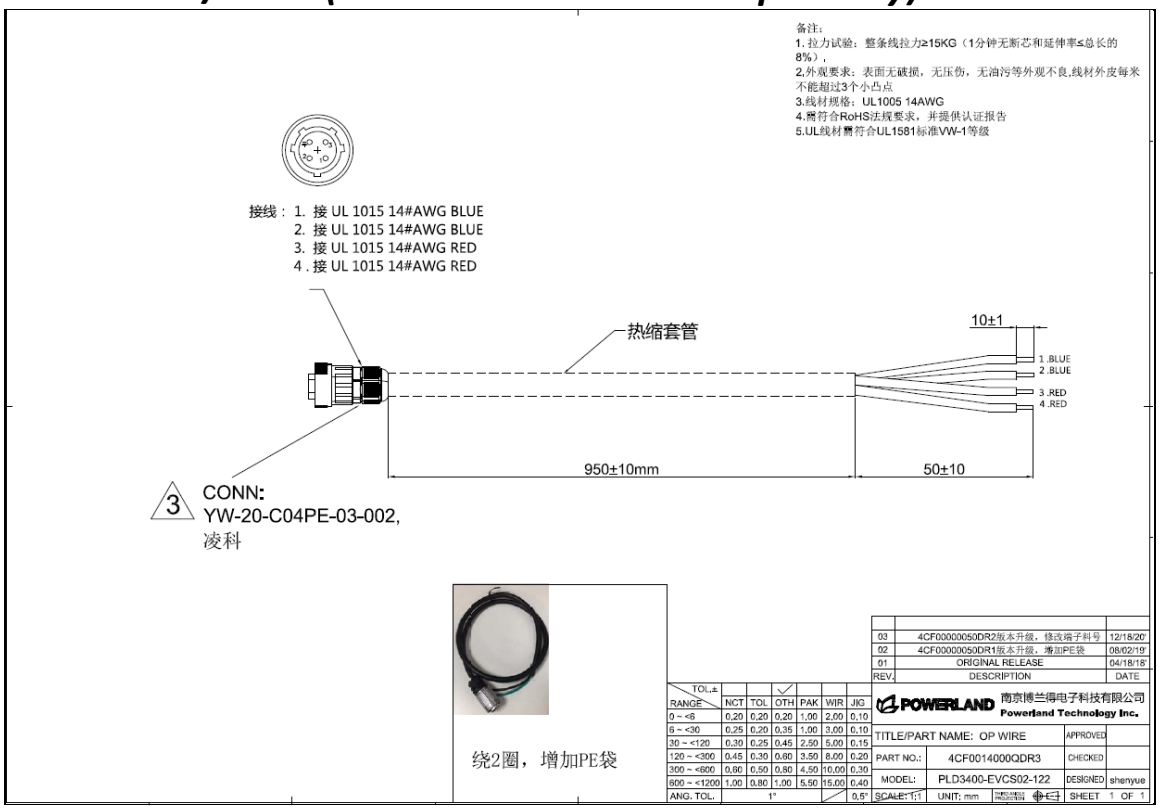
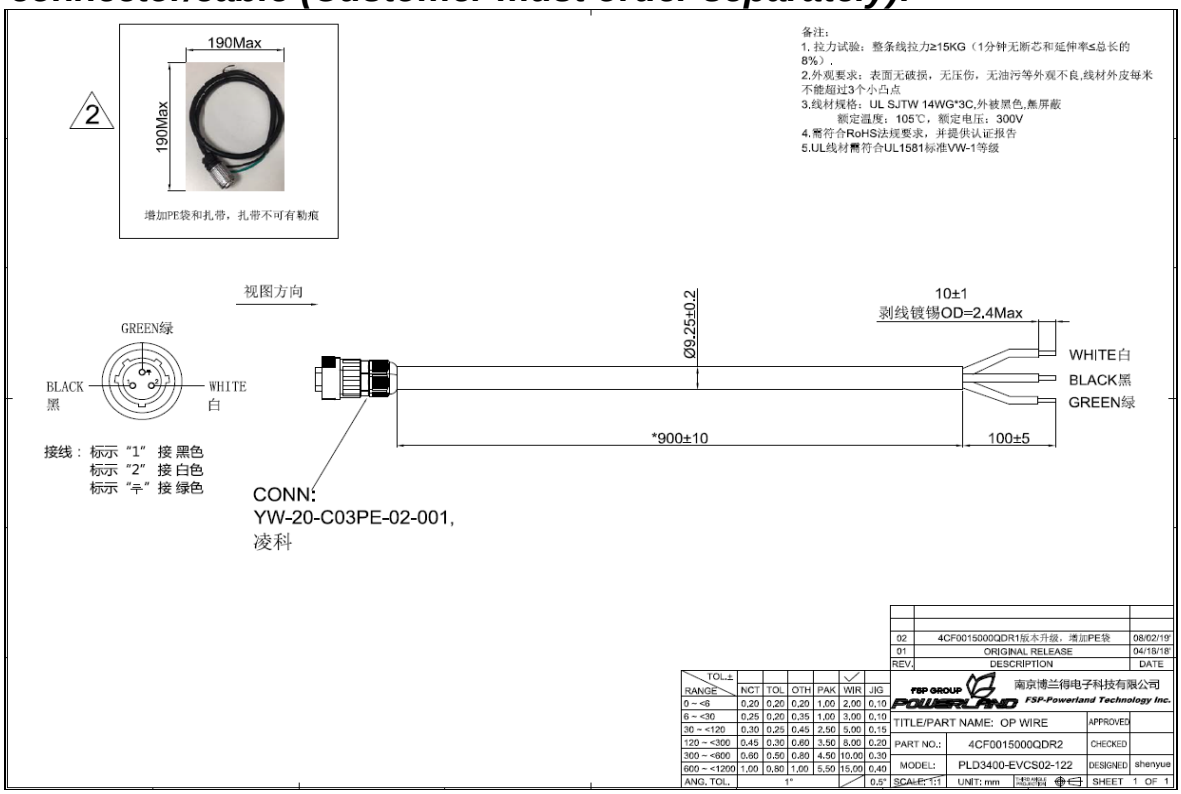
Input and Output Pins: (All Output Voltage Versions):

Pin	Input Connector Function	Input Connector Function
1	L (Line)	VO- (Output negative)
2	N (Neutral)	VO- (Output negative)
3	Not applicable	VO+ (Output positive)
GND	PE (Protective Earth)	VO+ (Output positive)

Signal Connector Pin Function (Connector: JAE MX23A18NF1):

Pin	EVC-122-3400-FC and EVC-116-3400: (70~122Vo Function)	Pin	EVC-84-3400 all models: (55~84Vo Function)
1	Not Connected	1	CAN_H1
2	Not Connected	2	CAN_L1
3	Not Connected	3	Not Connected
4	Can_Gnd	4	Not Connected
5	Can_5V	5	Not Connected
6	Can_L	6	Test for Factory
7	Can_H	7	Not Connected
8	Test for Factory	8	Slave_ENA
9	Not Connected	9	ISO_GND1
10	AC_OK	10	Not Connected or 12Vin (For J1772)
11	AC_OK	11	Not Connected or Slave_ENA1(For J1772)
12	Charger_ENA	12	Not Connected or PE (For J1772)
13	12V_ISO_GND	13	Not Connected or PROXIMITY (For J1772)
14	12V_ISO	14	Not Connected or PILOT (For J1772)
15	DGND	15	Not Connected
16	BKGO/MS	16	Not Connected
17	Reset	17	CHARGE_ENA
18	+5VSB	18	12V_ISO1

Output connector/cable (Customer must order separately):



Input connector/cable (Customer must order separately):