Electric Vehicle Tools & Equipment

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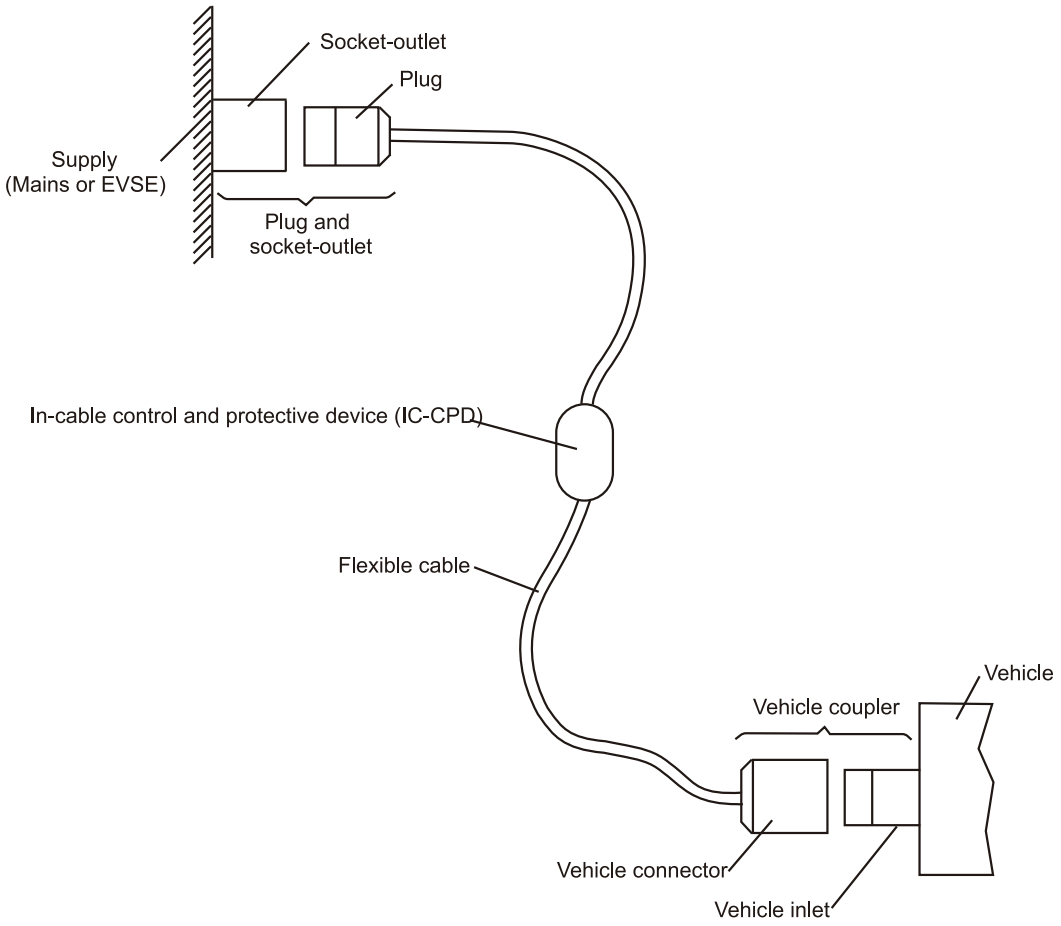
WSAT

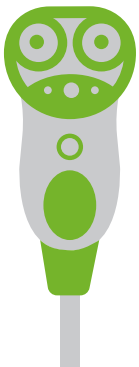
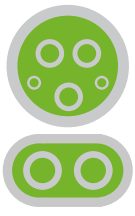
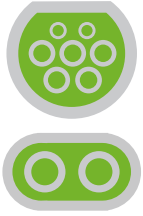
1. EV Charging Terms and Definitions



IEC 1877/14

2. EV Charging Connector Types

Connectors varies by region, by charging current and also by car manufacturer

	N.America	Japan	EU *and the rest of markets*	China	All Markets *except EU*
AC	 J1772 (Type 1)	 J1772 (Type 1)	 Mennekes(Type 2)	 GB/T	 Tesla
DC	 CCS1	 CHAdeMO	 CCS2	 GB/T	

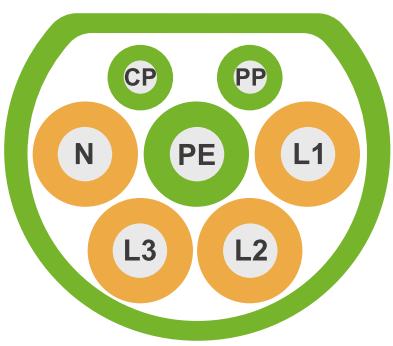
AC (Alternating Current) and DC (Direct Current) are two types of electrical current:

AC (Alternating Current): AC is an electric current that reverses direction periodically. The voltage and current in an AC circuit vary over time, changing direction from positive to negative. AC is commonly used in homes and industries because it can be easily transformed using transformers, making it suitable for long-distance distribution.

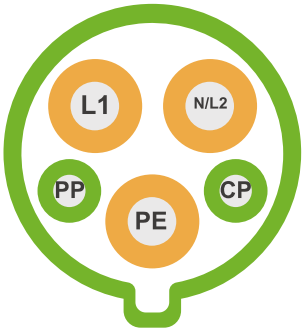
DC (Direct Current): DC is an electric current that flows in one direction. The voltage and current in a DC circuit remain constant in terms of direction. DC is typically provided by batteries and is used in many electronic devices and automotive applications due to its stable nature.

Connectors varies by region, by charging current and also by car manufacturer

Function	Notes
L1	"AC Line 1" for 220-230 V
L2	"AC Line 2" or spare terminal
L3	"AC Line 3" or spare terminal
PE	"Protective Earth" aka Ground
N	In the SAE J1772 "AC Neutral" for 120V Level 1 charging or "AC Line 2" for 208–240V Level 2 charging
PP	"Proximity Pilot" aka "plug present", which provides a signal to the vehicle's control system so it can prevent movement while connected to the electric vehicle supply equipment (EVSE; i.e., the charging station), and signals the latch release button to the vehicle.
CP	"Control Pilot" is a communication line used to signal charging level between the car and the EVSE, and can be manipulated by vehicle to initiate charging as well as other information.The signal is a 1 kHz square wave at ±12 volts generated by the EVSE to detect the presence of the vehicle, communicate the maximum allowable charging current, and control charging begin/end.



EU Standard (ICE 62196)



US Standard (SAE J1772)

3. EV Charging Mode

Method for connection of an EV to the supply network to supply energy to the vehicle

Mode 1

Mode 1 is a method for the connection of an EV to a standard socket-outlet of an AC supply network, utilizing a cable and plug, both of which are not fitted with any supplementary pilot or auxiliary contacts.

Mode 3

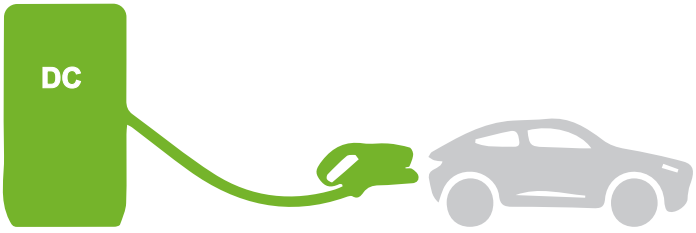
Mode 3 is a method for the connection of an EV to an AC EV supply equipment permanently connected to an AC supply network, with a control pilot function that extends from the AC EV supply equipment to the EV.

Mode 2

Mode 2 is a method for the connection of an EV to a standard socket-outlet of an AC supply network utilizing an AC EV supply equipment with a cable and plug, with a control pilot function and system for personal protection against electric shock placed between the standard plug and the EV.

Mode 4

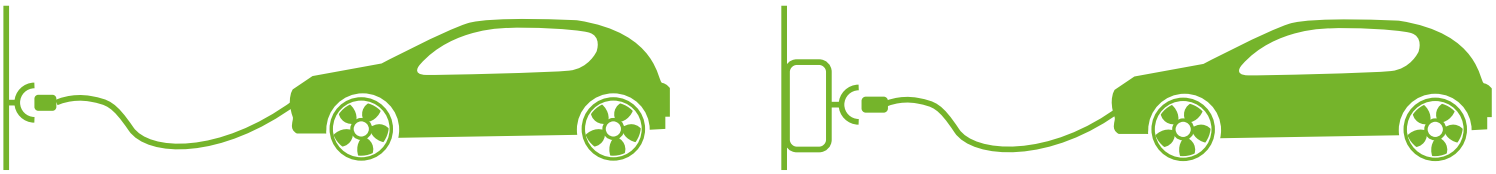
Mode 4 is a method for the connection of an EV to an AC or DC supply network utilizing a DC EV supply equipment, with a control pilot function that extends from the DC EV supply equipment to the EV.



4. EV Connection Case

CASE A

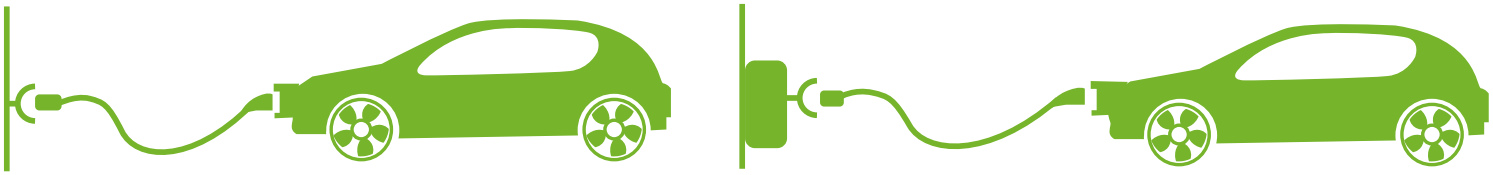
Connection of an EV to the supply network with a plug and cable permanently attached to the EV



Note 1 to entry: The cable assembly is part of the vehicle

CASE B

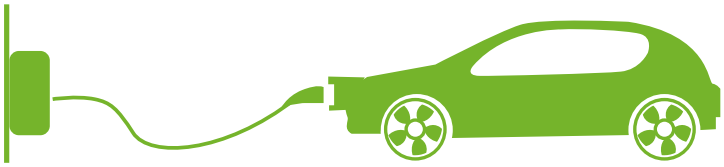
Connection of an EV to a supply network with a cable assembly detachable at both ends



Note 1 to entry: The detachable cable assembly is not part of the vehicle or the charging station.

CASE C

Connection of an EV to a supply network utilizing a cable and vehicle connector permanently attached to the EV charging station.



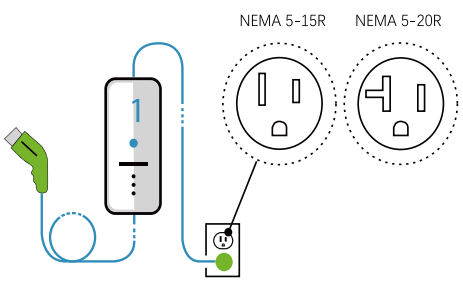
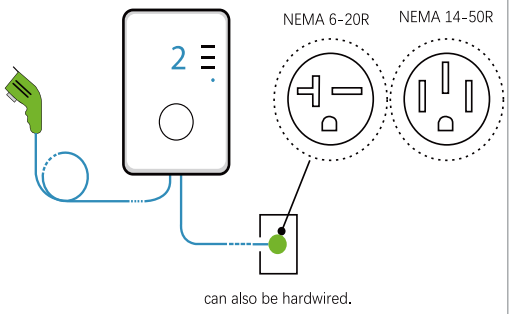
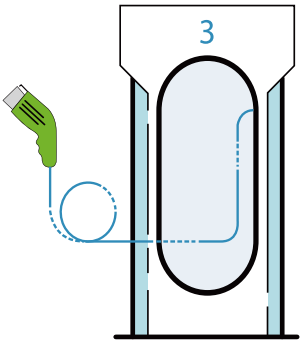
Note 1 to entry: The cable assembly is part of the EV charging station.

5.Know Your EV Charging Time

Rated Current	Charge Power	Charge Time		
		60kWh Battery	70kWh Battery	80kWh Battery
16A	3.84kW	15.6hr	18.2hr	20.8hr
32A	7.68kW	7.8hr	9.1hr	10.4hr
40A	9.6kW	6.25hr	7.3hr	8.3hr
48A	11.52kW	5.2hr	6hr	6.9hr
50A	12kW	5hr	5.8hr	6.6hr
16A(Three-phase)	11kW	5.4hr	6.4hr	7.3hr
32A(Three-phase)	22kW	2.7hr	3.2hr	3.6hr

The current mainstream EVs on the market have battery capacities ranging from 60 to 100 kWh. The time required for charging with their chargers varies depending on the vehicle model and the remaining battery level.
For example, Using our 32A Wallbox Charging Station, the Tesla Model 3 Standard Range, with its 62.3 kWh battery capacity and 272-mile range, can be charged from 0% to 100% in about 8 hours.

6. American EV Charging Levels

KNOW YOUR EV CHARGING STATIONS					
Level 1		Level 2		Level 3 (DC Fast Charger)	
					
Voltage	120V 1-Phase AC	Voltage	208V or 240V 1-Phase AC	Voltage	208V or 480V 3-Phase AC
Current	12-16 Amps	Current	12-80 Amps (Typ. 32 Amps)	Current	<300 Amps (Typ. 60 Amps)
Charging loads	1.4 to 1.9 kW	Charging loads	2.5 to 19.2 kW (Typ. 7kW)	Charging loads	<200 kW (Typ. 50kW)
Application	Residential use	Application	Residential & commercial use	Application	Commercial use
Miles per hour charge	3-9 Miles of Range Per Hour	Miles per hour charge	12-90 Miles of Range Per Hour	Miles per hour charge	80% Charge in 20-30 Minutes

Note: To ensure compliance with American electrical standards, it is important to select appropriate plugs and sockets based on the output currentof the charging equipment. If the output current exceeds 40A, it is advisable to use a hard-wired connection for enhanced safety and reliability.

7. Charging Gun Head

CN Standard (GB/T)

Charging Type	AC
Input Voltage	250V/440V
Rated Current	16A/32A/63A
Power Phase	Single Phase Three Phase

US Standard (Type 1) (SAEJ1772)

Charging Type	DC/AC
Input Voltage	DC 600V/ AC 250V
Rated Current	DC 80A/150A/200A AC 16A/32A/63A

EU Standard(Type 2) (CCS IEC)

Charging Type	DC/AC
Input Voltage	DC 1000V/ AC 250V
Rated Current	AC 16A/32A DC 200A/250A

8. Portable Charging Gun

Safety Protection:

CP fault protection, leakage protection, overcurrent protection, overvoltage protection, undervoltage protection,
over-temperature protection at the plug and inside the box

Product Features:

- ***Intelligent Display*** – Monitor charging status in real time
- ***Smart Scheduling*** – Set charging times and record duration & energy consumption
- ***Wide Compatibility*** – Works with most electric and hybrid vehicles
- ***Premium Cable*** – Pure copper, COC-certified for safety and durability
- ***Adjustable Current*** – Flexible charging to match your needs
- ***Secure Lock Function*** – Supports vehicle charging gun lock
- ***Auto Stop*** – Automatically ends charging when the battery is full

1) AC 3.5KW Portable Charging Gun

CN Standard: GB/T

US Standard (Type 1): SAE

EU Standard (Type 2): IEC

Input Voltage	AC 110V-240V
Rated Current	8~16A adjustable
Rated Power	3.5KW
Cable Length	5/10/15/20M

2) AC 7KW-22KW Portable Charging Gun

CN Standard: GB/T

US Standard (Type 1): SAE

EU Standard (Type 2): IEC

Input Voltage	Three Phase AC 380V/ AC 110V-240V
Rated Current	16A-32A adjustable
Rated Power	Three Phase AC 11KW-22KW / AC 3.5KW-7KW
Power Phase	Single Phase/ Three Phase
Cable Length	5/10/15/20M

3) AC 3.5KW-11KW TESLA Portable Charging Gun

TESLA Standard

Working Voltage	AC 110V-240V
Rated Current	16-32A adjustable (7KW) 16-48A adjustable (11KW)
Rated Power	3.5KW-7KW (7KW) 3.5KW-11KW (11KW)
Cable Length	5/10/15/20M

9. AC 7KW-22KW Wall-Mounted Charger

Safety Protection:

CP fault protection, leakage protection, overcurrent protection, overvoltage protection, undervoltage protection, over-temperature protection at the plug and inside the box

Product Features:

- ***Secure Card Charging*** – Prevents unauthorized charging
- ***Smart Scheduling*** – Set charging times and track duration & energy usage
- ***Wide Compatibility*** – Suitable for most electric and hybrid vehicles
- ***Premium Cable*** – High-quality pure copper, COC-certified
- ***Adjustable Current*** – Flexible charging to meet different needs
- ***Secure Lock Function*** – Supports vehicle charging gun lock
- ***Auto Stop*** – Automatically ends charging when fully charged
- ***Intelligent Display*** – Real-time monitoring of charging status

CN Standard: GB/T

US Standard (Type 1): SAE

EU Standard (Type 2): IEC

Input Voltage	Three Phase AC 380V/ AC 110V-240V
Rated Current	16A-32A adjustable
Rated Power	Three Phase AC 11KW-22KW / AC 3.5KW-7KW
Power Phase	Single Phase/ Three Phase
Cable Length	5/10/15/20M

10. AC 7KW-22KW Charging Pillar

CN Standard: GB/T

US Standard (Type 1): SAE

EU Standard (Type 2): IEC

Input Voltage	Three Phase AC 380V/ AC 110V-240V
Rated Current	16A-32A adjustable
Rated Power	Three Phase AC 11KW-22KW / AC 3.5KW-7KW
Power Phase	Single Phase/ Three Phase
Cable Length	5/10/15/20M

11. DC 30–80 KW ALL-IN-ONE Fast Charging Station

Standard: GB/T, SAE, IEC

Output Voltage	DC200-1000V
Rated Power	30KW/40KW/60KW/80KW
Rated Current	100A/125A/150A/200A
Interface	7" color touch LCD
Installation	Floor-stand
Wiring Method	Bottom incoming
Output Voltage	DC200-1000V

12. AC 3.5-7KW Home Charger

Standard: GB/T, SAE, IEC

Input/Output Voltage	AC220V+15%
Rated Power	3.5-7KW
Rated Current	16A-32A

13. Charging Cable With Dual Gun Head

Input Voltage	220-250V / 380-450V
Rated Current	16-32A
Rated Power	3.7kw, 7.4kw, 11.0kw, 22.0kw
Power Phase	Single Phase/ Three Phase

14. EV Standard Accessories

Charging Gun Head to Vehicle End

US Standard (Type 1)

EU Standard (Type 2)

Power Supply Terminal to Power Socket

Type 1 to Type 2 Charging Adaptor

Portable Type 1 to Type 2

Charger Plug Holder

For Type 1 Straight

For Type 1 Bend

For Type 2 Straight

For Type 2 Bend

Charging Socket

15. Testing Tools for New Energy Vehicle

EV Battery Pack Diagnostic Kit
Battery pack "professional grade" testing
Dedicated connector for battery pack testing
Offline testing capability
Comprehensive vehicle series and full system inspection

Integrated EV Battery Pack Diagnostic Kit
Integration of Four Types of Testing Tools, including oscilloscope, multimeter, insulation tester and current clamp

Insulation Resistance Tester
Complete measurement of the insulation resistance, voltage, and other parameters.
Supports 3 modes of comparative measurement, continuous measurement and timed measurement, and can measure AC and DC voltage

Current Clamp
Non-contact DC test
Anti-electromagnetic interference
Automatically select the range, combined with the noise reduction algorithm

Two-channel Oscilloscope & Multimeter
suitable for current, voltage and resistance measurement of electric vehicles.
Provide 3 measurement functions, including manual, tracking, automatic cursor

EV Battery Airtightness Detector
Mainly uses compressed air as a medium to exert certain pressure on the inner cavity or outer surface of the product to be tested, and then uses high-sensitivity sensors to detect the change of pressure, so as to determine the sealing performance of the product to be tested.

EV Battery Cell Equalizer
Quickly solve the cruising range degradation caused by the battery capacity difference due to battery voltage inconsistency.
Suitable for all lithium battery types.

EV Battery Charge & Discharge Equipment
A battery pack module integrated charge-discharge machine is designed based on the characteristics of lithium-ion batteries used in electric vehicles. It can efficiently perform the charging, discharging, and balancing of battery pack modules.

Adjustable High Voltage Power Supply
Adjustable Power Supply for EV and fuel vehicles, was designed with isolated low and high voltage modules to provide dual output, and can be remotely controlled by Bluetooth.

EV & Battery Pack Diagnosis Add-On Kit
Comes with battery pack testing cables for various vehicle brands.

16. EV Battery Lift

Pneumatic Hydraulic Lift

Lifting Capacity	1000kg/1500kg
Max. Lifting Height	1065mm

Electro-Hydraulic Battery Lift

Lifting Capacity	1000kg
Max. Lifting Height	1185-1860mm

Electro-Hydraulic Battery Lift

Max. lifting capacity	1000kg
Max. lifting height	1850mm
Max. size of bracket	L1344*w950mm

EV Battery Lift

Powered	Electric/Pneumatic
Lifting Capacity	1200kg
Lifting Height	800-1800mm

EV Battery Lift

Powered	Electric/Pneumatic
Lifting Capacity	1500KG
Lifting Height	1100-1850mm

Electric EV Battery Lift

Lifting Capacity	1500kg
Lifting height	1900mm

Electric EV Battery Lift

Lifting Capacity	1500kg
Lifting height	1800mm