20 December 2024
CHAdeMO Association Europe

Supplementary information on L-category DC charging standards for AFIR delegated regulation

Summary

- Requiring *at least 'Combo 2' for Mode 4 normal- and high-power recharging points reserved for L-category electric vehicles* does not meet the needs of the industry or users. Instead, IEC 62196-6 should be designated.

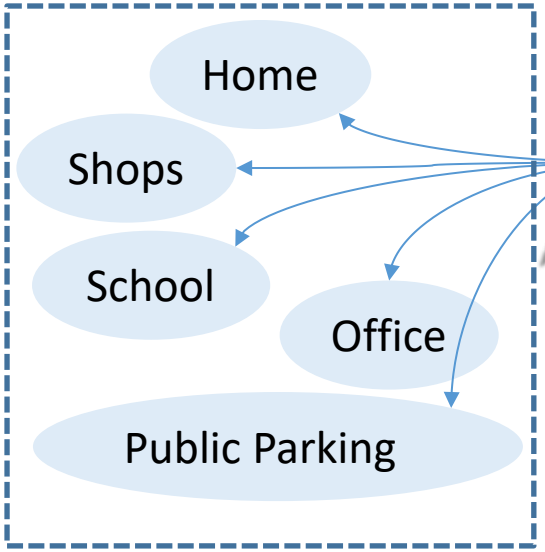
- IEC 62196-6 & IEC 61851-25 are specifications for a DC charging method that is optimised for smaller e-PTWs with a voltage range of 0-120V, common for many e-PTWs*.

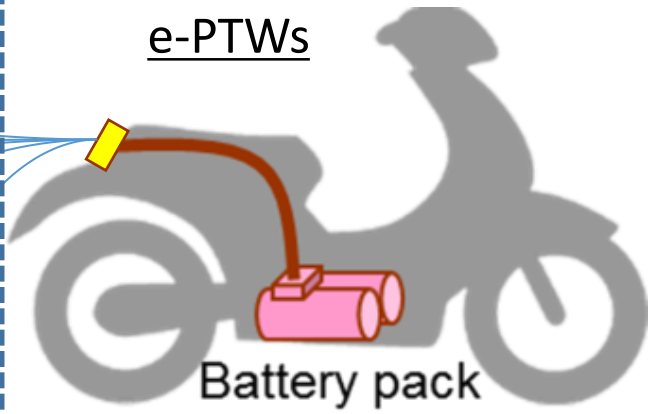
- Despite the small size of the connector, it can handle high currents up to 100A, while providing low-power charging with high current accuracy.

- These allow e-PTWs to DC charge at fast- and normal-speeds, eliminating the need for heavy and costly on-board chargers, which is an important major contribution to the wider adoption of e-PTWs.

Note: *e-PTW stands for electric powered two- and three-wheeler (and quadricycle).

DC charging systems for e-PTWs





Light weight and low cost

➡ No on-board charger

Charging at home and in public areas

➡ Small DC charging system

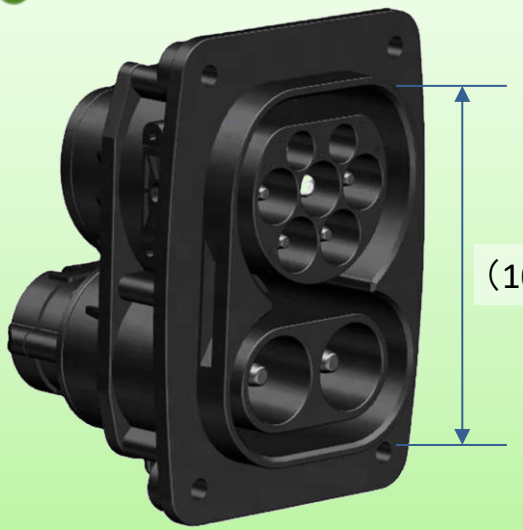
Vehicle type*	Public charging Infrastructure			Private AC charging (at house)
	Small DC charging system (～12kVA)	Large DC charging system (CHAdeMO/CCS etc.)	AC charging system	
50 c.c. Class	○	NA	○	○
125 c.c. Class	○	NA	○	○
250 c.c. Class	△	○	○	○
400 c.c. Class	NA	○	○	○

○ Suitable
△ Feasible
NA Basically not available

Note: *The Vehicle type is estimated from the equivalent gasoline engine PTWs.

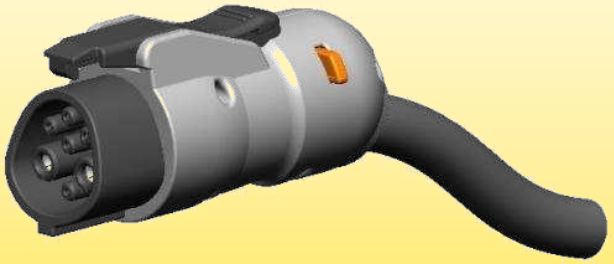
Small DC charging system optimized for small e-PTWs

for passenger cars



It would be difficult to install on a small e-PTW due to its size.

for (small) e-PTWs



Mating surface size is equivalent to IEC 62196-2 type1 (SAE J1772 AC-charging) connector.

International standard for coupler IEC/EN 62196-6

published 2022-04-22

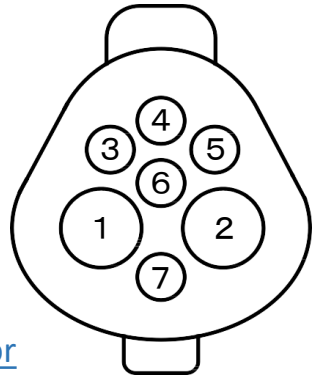
Title

Plugs, socket-outlets, vehicle connectors and vehicle inlets
– Conductive charging of electric vehicles
– Part 6: Dimensional compatibility requirements for DC pin and contact-tube vehicle couplers intended to be used for DC EV supply equipment where protection relies on electrical separation

Scope

This part of IEC 62196 is applicable to vehicle connectors, vehicle inlets and cable assemblies for electric vehicle (EV), intended for use in conductive charging systems which incorporate control means, with a rated operating voltage up to **120 V DC** and rated current up to **100 A**.

These accessories are intended to be used for a DC interface of the conductive charging system according to **IEC 61851-25:2020**.



Mating surface of the charging connector viewed from the vehicle inlet side

Pin number	Pin function
1	DC +
2	DC -
3	Control pilot
4	Communication (CAN) (+)
5	Communication (CAN) (-)
6	Auxiliary power supply (+)
7	Auxiliary power supply (-)

IEC 62196-6:2022 | IEC Webstore

Outline of IEC/EN 61851-25 （DC Charging system）

Output (DC) range:

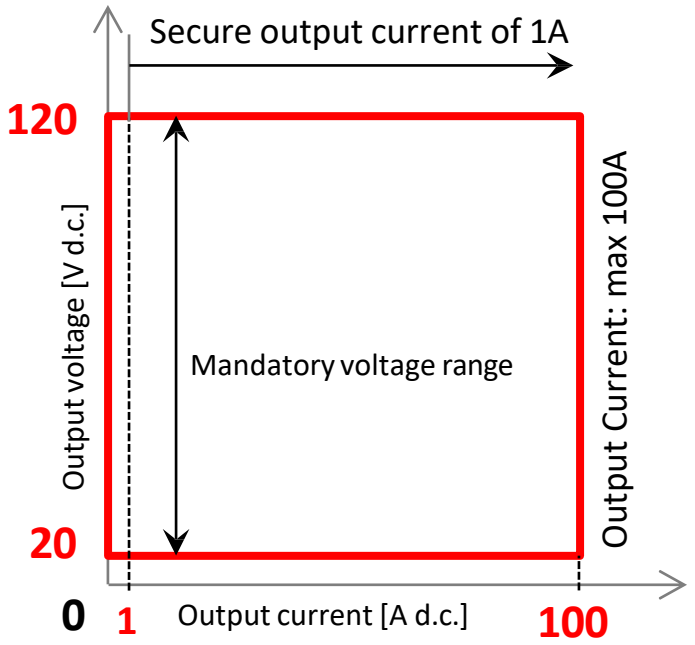
Output voltage range:
20 to 120 V (mandatory)

Output current range:
0 to 100 A maximum

Note

1) Output current does not necessarily have to be up to 100A (for example, max 50A is acceptable).

2) In stop mode, the output is switched off when the output current drops below 1A.



Current accuracy:

Conditions	Specifications			
	Min	Typ	Max	Unit
Charge current command value: 0A-10A	Typ -0.5A	Charge current Command value	Typ +0.5A	A
Charge current command value: 10A or more	Typ×95%		Typ×105%	

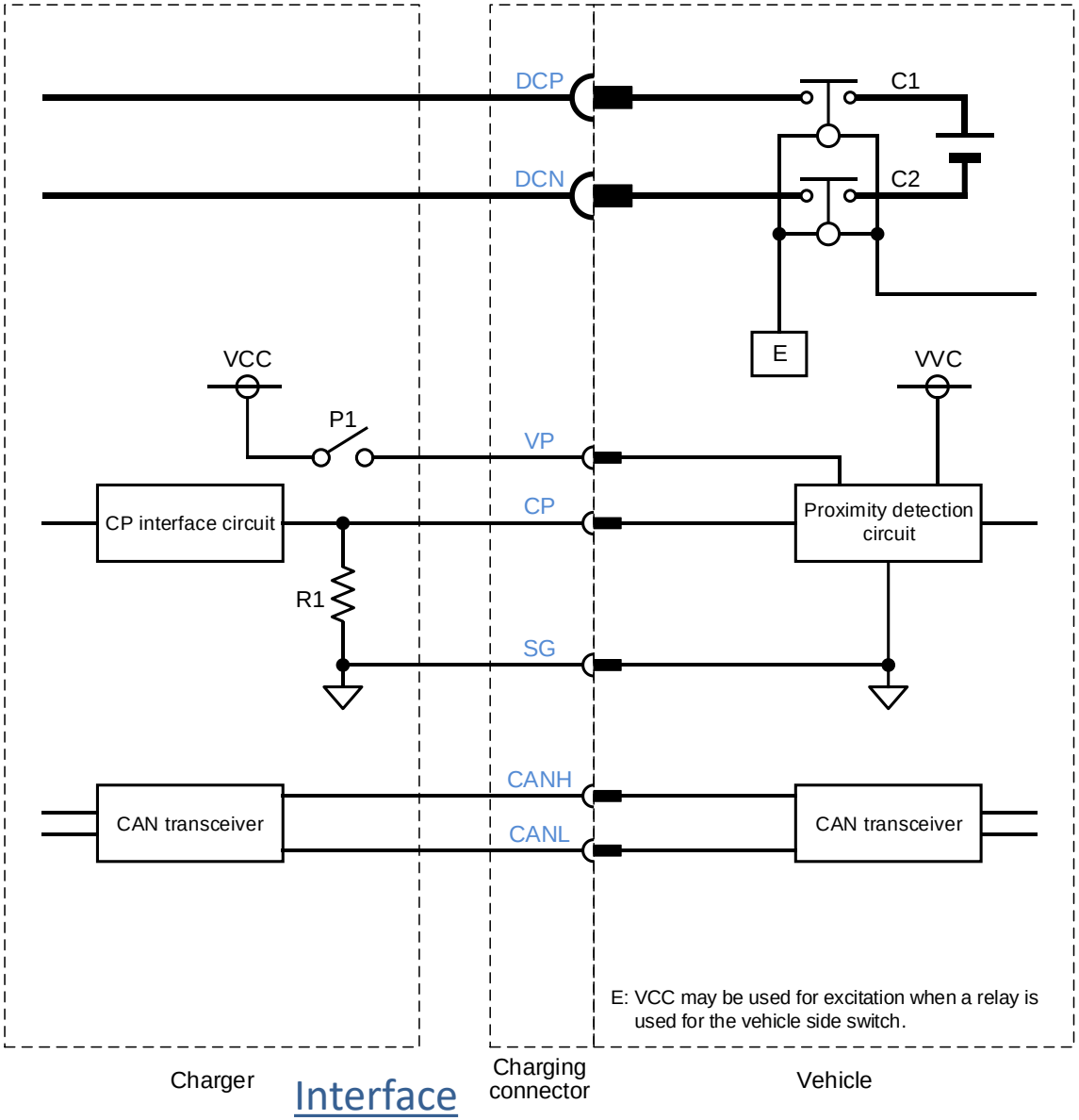
Outline of IEC 62196-6 & IEC 61851-25 (Interface)

Same as passenger car systems:

- CAN is used for digital communication.
- Dual system at start/stop is maintained.
  (CP (Control Pilot) line and CAN communication)

Specificities:

- Interface is simplified from the passenger car systems.
- The minimum units for volts and amperes are set to 0.1 ([A], [V]).
- Control power for the vehicle side can be supplied from the charger side in case the vehicle side battery is fully discharged.
- Charging standby mode is added considering the temperature control of the traction battery may not be sufficient.



[FYI] IEC 62196-6 adoption in international e-PTW markets

- Taiwan and India already adopted IEC 61851-25 and IEC 62196-6 as their national standards.

India: (same as the IEC standard)

- IS17017-25…Conductive charging system
- IS17017-2-6…Vehicle Connectors and Vehicle Inlets

Taiwan: (some differences from the IEC standard)

- CNS 16125…General requirement
- CNS 16127…Standard interface for d.c. power supply systems
- CNS 16128…Digital communication for d.c. charging

- Products on the market

India:

Ola Electric S1

Taiwan:

E-moving iE125

eTreego 1.2kW(12A)

eTreego 12kW(100A)

About CHAdeMO Association

CHAdeMO Association is an alliance of e-mobility stakeholders around the CHAdeMO DC charging standards (IEC/EN/IEEE), supporting the transport sector's transition towards carbon neutrality from the charging technology side. Founded in 2010 with the mission of ***providing safe, affordable and interoperable charging for all type of EV users***, the Association provides various DC charging standards optimised to different types of EVs - from trucks and buses to electric two/three-wheelers and bicycles. It has today over 500 member organisations from 45 countries, including vehicle OEMs, electricity providers, charger, battery, and component manufacturers, as well as research institutes and municipalities.

CHAdeMO members are active contributors in the domain of electro-mobility at international standardization arena, notably at IEC, ISO, iEEE, etc. CHAdeMO develops standards, but the Association itself, a not-for-profit association, does not develop, commercialise, install, or operate any chargers. CHAdeMO Association is a Type-C member of DG MOVE's STF sub-group on governance and standards for communication exchange in the electro-mobility ecosystem, contributing to the discussions around AFIR-related standards since 2021.

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CHAdeMO

About CHAdeMO Association

Our members

And many, many more..

About

500

entities from

45

countries

CHAdeMO