

SAE J3068 Update

EV Power Transfer using Three-phase Capable Coupler

EPRI IWC

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Scope of J3068

- The SAE has authorized a document for three-phase AC charging for electric vehicles
- Scope

This document covers the general physical, electrical, functional, testing, and performance requirements for conductive power transfer to an electric vehicle using a coupler capable of, but not limited to, transferring three-phase AC power. It defines a conductive power transfer method including the digital communication system. It also covers the functional and dimensional requirements for the vehicle inlet, supply equipment outlet, and mating housings and contacts.
- **Targeted towards charging at commercial and industrial locations or other places where three-phase power is available and preferred.**

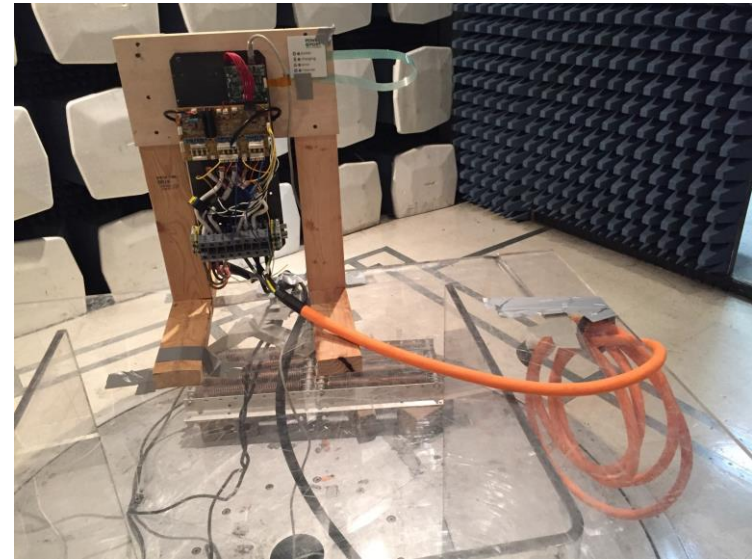
J3068

- EVSE
 - Evaluated to UL-2594, UL-2231
- Cordset / Coupler
 - Directly refers to IEC mechanical drawings
 - 62196-2 Sheets 2-II f and 2-II e
 - Evaluated to UL-2251
- Power levels and voltage
 - Voltages
 - USA 208/120Y & 480/277Y VAC
 - Canada 208/120Y & 600/347Y VAC
 - Power example
 - 16A 480VAC 3 ϕ = 11kW
 - 80A 480VAC 3 ϕ = 65kW
 - 160A 480VAC 3 ϕ = 133kW

J3068 Draft Document Posted

- May 11 Draft posted in SAE TEVHYB13 J3068 “Work Area”
- 51 pages
- Includes:
 - Basic electrical requirements
 - Mechanical references
 - Messaging
- Good progress since last IWC

J3068 at NREL



- Testing at NREL for J3068
- Energy Systems Integration Facility (ESIF) at the U.S. Department of Energy's National Renewable Energy Laboratory in Golden, CO
- Transpower school bus
- Type-2 three-phase AC inlet
- Integrated motor inverter/charger (EPC Power)
- Charges and discharges into grid up to 70kW
- Test with AC EVSE shown on right (shown case-less during EMI testing)

J3068 – Inlet and Connector

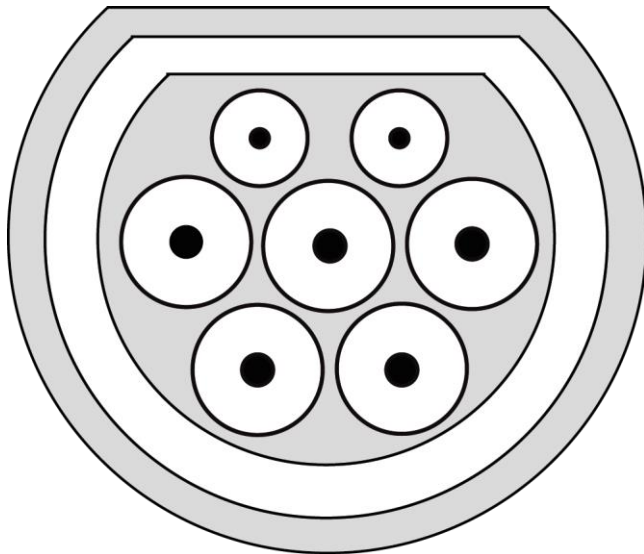


Illustration of Vehicle Inlet

For mechanical specs see IEC 62196-2 Sheet 2-II f

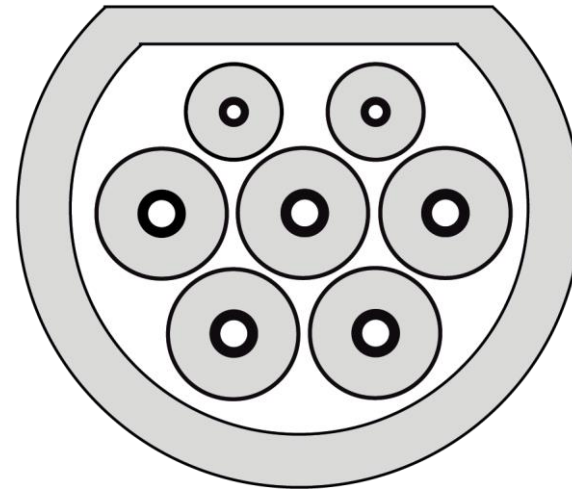


Illustration of Vehicle Connector

For mechanical specs see IEC 62196-2 Sheet 2-II e

J3068 Electrical Specifications

Note: J3068 electrical specifications are for MX, CA, US and are beyond what is currently defined in the IEC 62196 series

- Current not exceeding 160 A AC three-phase
- Nominal voltages up to 600 V AC three-phase
- Must comply with UL 2251

J3068 – Combo Inlet and Connector

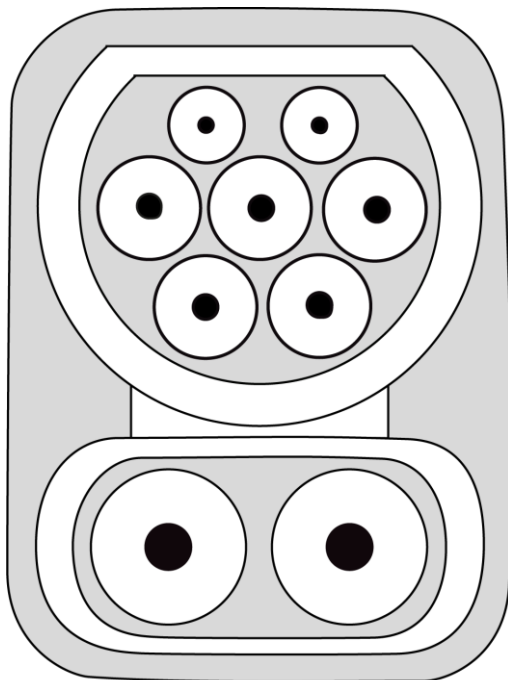


Illustration of Vehicle Inlet
For mechanical specs see IEC 62196-3 Sheet 3-IVa

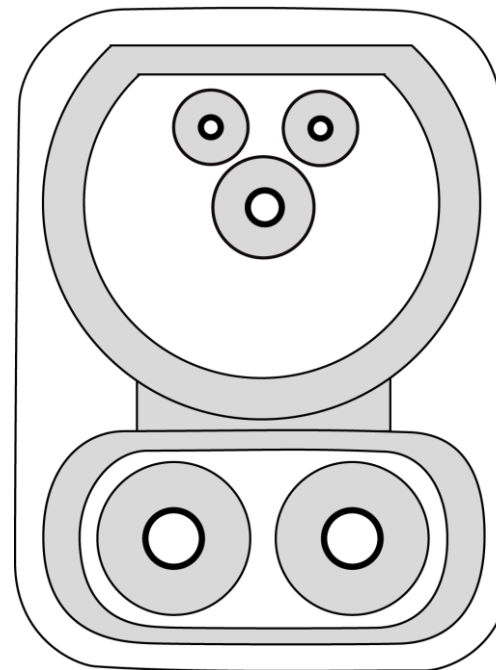
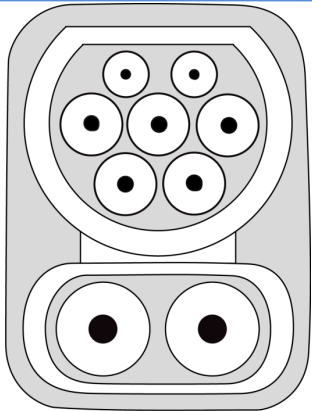


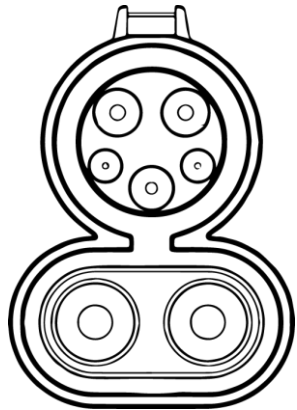
Illustration of Vehicle Connector
For mechanical specs see IEC 62196-3 Sheet 3-IVc

J3068 – Combo Inlet



- ✓ Three-phase AC (6mm pins)
- ✓ Single-phase also allowed (including 277 VAC)
- ✓ Can DC charge using SAE CCS communication standards
- ✗ Uncommon for North American passenger cars

IEC 62196-3 Sheet 3-IVa
"Type 2 Combo"



- ✓ Single-phase AC (3.6mm pins)
- ✓ DC charge using SAE CCS communication standards
- ✓ Used on several North American passenger cars with infrastructure installed in many locations
- ✗ Limited AC power; no three-phase; no mandatory AC lock

J1772 CCS / "Type 1 Combo"

The End

Questions?