

National Electric Transportation Infrastructure Working Council Meeting

UL Discussion

Introduction

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Automotive Equipment and Associated Technologies

- Electric Vehicle Charging Equipment, UL 2202
- Electric Vehicle Supply Equipment, UL Sub 2594
- Electric Vehicle Connectors and Inlets, UL 2251

Contents

Two topics of discussion:

- Cord Connection
- Grounded Systems vs. Isolated Systems

Cord Connection

625.13 Electric Vehicle Supply Equipment.

Electric vehicle supply equipment rated at 125 volts, single phase, 15 or 20 amperes or part of a system identified and listed as suitable for the purpose and meeting the requirements of 625.18, 625.19, and 625.29 shall be permitted to be cord and-plug-connected. All other electric vehicle supply equipment shall be permanently connected and fastened in place. This equipment shall have no exposed live parts.

625.18 Interlock. Electric vehicle supply equipment shall be provided with an interlock that de-energizes the electric vehicle connector and its cable whenever the electrical connector is uncoupled from the electric vehicle. An interlock shall not be required for portable cord-and-plug-connected electric vehicle supply equipment intended for connection to receptacle outlets rated at 125 volts, single phase, 15 and 20 amperes.

625.19 Automatic De-Energization of Cable.

The electric vehicle supply equipment or the cable-connector combination of the equipment shall be provided with an automatic means to de-energize the cable conductors and electric vehicle connector upon exposure to strain that could result in either cable rupture or separation of the cable from the electric connector and exposure of live parts. Automatic means to de-energize the cable conductors and electric vehicle connector shall not be required for portable cord-and-plug-connected electric vehicle supply equipment intended for connection to receptacle outlets rated at 125 volts, single phase, 15 and 20 amperes.

625.29 Indoor Sites. Indoor sites shall include, but not be limited to, integral, attached, and detached residential garages; enclosed and underground parking structures; repair and nonrepair commercial garages; and agricultural buildings.

(A) Location. The electric vehicle supply equipment shall be located to permit direct connection to the electric vehicle.

(B) Height. Unless specifically listed for the purpose and location, the coupling means of the electric vehicle supply equipment shall be stored or located at a height of not less than 450 mm (18 in.) and not more than 1.2 m (4 ft) above the floor level.

(C) Ventilation Not Required. Where electric vehicle nonvented storage batteries are used or where the electric vehicle supply equipment is listed or labeled as suitable for charging electric vehicles indoors without ventilation and

Grounding vs. Isolation

Standards:

The Standard for Personnel Protection Systems for Electric Vehicle (EV) Supply Circuits, General Requirements

UL 2231-1

The Standard for Personnel Protection Systems for Electric Vehicle (EV) Supply Circuits, Particular Requirements for Protection Devices for Use in Charging Systems

UL 2231-2

6.2.2 When there is no more than 15 Vrms between conductors, only basic insulation is required.

6.2.3 When there is more than 15 Vrms but not more than 150 Vrms between any two conductors, then basic insulation plus an isolation monitor/interrupter is required.

6.2.4 When there is more than 150 Vrms but not more than 1000 Vrms between any two conductors then the requirement shall be satisfied by providing one of the following:

- a) A minimum of basic insulation plus a ground monitor/interrupter and an isolation monitor/interrupter.
- b) A minimum of basic insulation plus an isolation monitor/interrupter with a self check,
- c) Double insulation plus an isolation monitor/interrupter, or
- d) Reinforced insulation plus an isolation monitor/interrupter.

