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Group**

C22.2 No. 280-16

Electric vehicle supply equipment

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Underwriters Laboratories Inc.
UL 2594
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Standard for Electric Vehicle Supply Equipment

December 21, 2016



ANSI/UL 2594-2016

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Preface

This is the harmonized ANCE, CSA Group, and UL Standard for Electric Vehicle Supply Equipment. It is the Second edition of NMX-J-677-ANCE, the Second edition of CSA C22.2 No. 280, and the Second edition of UL 2594. This edition of NMX-J-677-ANCE supersedes the previous edition published on February 22, 2013. This edition of CSA-C22.2 No. 280 supersedes the previous edition published on February 22, 2013. This edition of UL 2594 supersedes the previous edition published on February 22, 2013.

This harmonized standard was prepared by the Association of Standardization and Certification (ANCE), CSA Group, and Underwriters Laboratories Inc. (UL). The efforts and support of the Technical Harmonization Working Group for Electric Vehicle Supply Equipment are gratefully acknowledged.

This standard is considered suitable for use for conformity assessment within the stated scope of the Standard.

The present Mexican Standard was reviewed and approved by the Comité de Normalización de la Asociación de Normalización y Certificación, A.C., CONANCE.

This standard was reviewed by the CSA Subcommittee on Electric Vehicle Supply Equipment, under the jurisdiction of the CSA Technical Committee on Industrial Products and the CSA Strategic Steering Committee on Requirements for Electrical Safety, and has been formally approved by the CSA Technical Committee.

This standard has been approved by the American National Standards Institute (ANSI) as an American National Standard.

Application of Standard

Where reference is made to a specific number of specimens to be tested, the specified number is to be considered a minimum quantity.

Note: *Although the intended primary application of this standard is stated in its scope, it is important to note that it remains the responsibility of the users of the standard to judge its suitability for their particular purpose.*

Level of harmonization

This standard uses the IEC format but is not based on, nor is considered equivalent to, an IEC standard.

This standard is published as an equivalent standard for ANCE, CSA Group, and UL.

An equivalent standard is a standard that is substantially the same in technical content, except as follows: Technical national differences are allowed for codes and governmental regulations as well as those recognized as being in accordance with NAFTA Article 905, for example, because of fundamental climatic, geographical, technological, or infrastructural factors, scientific justification, or the level of protection that the country considers appropriate. Presentation is word for word except for editorial changes.

Reasons for differences from IEC

This standard provides general requirements for electric vehicle supply equipment for use in accordance with the electrical installation codes of Canada, Mexico, and the United States. At present there is no IEC standard for these products for use in accordance with these codes. Therefore, this standard does not employ any IEC standard for base requirements.

Interpretations

The interpretation by the standards development organization of an identical or equivalent standard is based on the literal text to determine compliance with the standard in accordance with the procedural rules of the standards development organization. If more than one interpretation of the literal text has been identified, a revision is to be proposed as soon as possible to each of the standards development organizations to more accurately reflect the intent.

INTRODUCTION

1 Scope

1.1 This Standard covers conductive electric vehicle (EV) supply equipment with a primary source voltage of 600 V ac or less, with a frequency of 50 or 60 Hz, and intended to provide ac power to an electric vehicle with an on-board charging unit. This Standard covers electric vehicle supply equipment intended for use where ventilation is not required.

1.2 With reference to 1.1, the following list of examples of electric vehicle supply equipment are included in this Standard:

- a) EV Cord Sets – Rated 125 Vac maximum, 16 A maximum, intended for indoor and outdoor use;
- b) Fastened in place EV Charging Stations – Rated 250 Vac maximum, 40 A maximum, intended for indoor or outdoor use;
- c) Fixed in place EV Charging Stations – Rated 600 Vac maximum, intended for indoor or indoor/outdoor use; and
- d) Fixed in place EV Power Outlet – Rated 600 Vac maximum, intended for indoor or indoor/outdoor use.

For Mexico, use 127 Vac where 120 or 125 Vac is referenced in this Standard. In Canada and the United States, this does not apply.

1.3 The products covered by this Standard are intended for use in accordance with the Installation Codes in Annex A, Ref. No.1.

1.4 This Standard does not cover cord sets or power supply cords for applications other than EV charging cord sets. For cord sets and power supply cords not covered by this Standard, refer to Annex A, Ref. No. 2 and No. 3.

1.5 With reference to 1.2, this Standard does not cover electric vehicle charging equipment. For EV charging equipment not covered by this Standard, refer to Annex A, Ref. No. 4.

1.6 This Standard does not cover electric vehicle connectors. For electric vehicle connectors not covered by this Standard, refer to Annex A, Ref. No. 5

1.7 This Standard does not cover regular-use power outlets. For regular-use power outlets not covered by this Standard, refer to Annex A, Ref. No. 6.

1.8 This Standard does not cover equipment intended for wireless power transfer, which may also be designated as wireless charging, inductive charging, magnetic resonance charging, or any other similar designation indicating the transfer of power from the EVSE to the vehicle through other than a conductive connection.

2 Units of Measurement

2.1 The values given in SI (metric) units shall be normative. Any other values given shall be for information purposes only.

3 Components

3.1 Except as indicated in 3.2, a component used as a part of a unit covered by this Standard shall comply with the requirements for that component.

3.2 A component is not required to comply with a specific requirement that:

- a) Involves a feature or characteristic not required in the application of the component in the product covered by this Standard, or
- b) Is superseded by a requirement in this Standard.

3.3 A component shall be used in accordance with its rating established for the intended conditions of use.

3.4 Specific components are incomplete in construction features or restricted in performance capabilities. Such components are intended for use only under limited conditions, such as certain temperatures not exceeding specified limits, and shall be used only under those specific conditions.

4 Normative References

4.1 Where reference is made to any Standard, such reference shall be considered to refer to the latest editions and revisions thereto available at the time of printing, unless otherwise specified.

4.2 Products covered by this Standard shall comply with the reference installation codes and Standards noted in Annex A as appropriate for the country where the product is to be used. When the product is intended for use in more than one country, the product shall comply with the installation codes and Standards for all countries where it is intended to be used.

4.3 For products intended for use in Canada, general requirements are given in Annex A, Ref. No. 75. In Mexico and the United States, this does not apply.

5 Definitions

5.1 For the purposes of this Standard, the following definitions apply. In addition, in the text of this document, the term “device” refers to the product covered by this Standard. The term “EV” applies to electric vehicles, including hybrid electric vehicles, plug-in electric vehicles, battery electric vehicles, and similar vehicles.

In Canada, all terms for which a definition appears in C22.2 No. 0 shall be deemed to have the definition as provided in C22.2 No. 0. The only exception is the definition of “Accessible” which shall remain as given in C22.2 No. 280-16. In Mexico and the United States, this does not apply.

5.2 ACCESSIBLE – Able to be contacted by an accessibility probe.

5.3 BONDED (BONDING) – The permanent joining of metallic parts to form an electrically conductive path that provides electrical continuity and the capacity to conduct any current likely to be imposed without a risk of electric shock or fire.

Note: See Figure 11 for an illustration of the terms “grounding” and “bonding” with corresponding terms for Canada and Mexico.