



JOINT CANADA-UNITED STATES
NATIONAL STANDARD

ANSI/CAN/UL 2252:2025

STANDARD FOR SAFETY

Adapters for Use with Electric Vehicle
Couplers

SCC FOREWORD

National Standard of Canada

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UL Standard for Safety for Adapters for Use with Electric Vehicle Couplers, ANSI/CAN/UL 2252

First Edition, Dated March 19, 2025

Summary of Topics

This First Edition of ANSI/CAN/UL 2252, Standard for Adapters for Use with Electric Vehicle Couplers, dated March 19, 2025 is issued as a new joint US/Canada Standard. This publication reflects the latest ANSI and SCC approval dates incorporating the proposals dated September 27, 2024 and January 17, 2025.

The requirements are substantially in accordance with Proposal(s) on this subject dated September 27, 2024 and January 17, 2025.

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ANSI/CAN/UL 2252:2025

Standard for Adapters for Use with Electric Vehicle Couplers

First Edition

March 19, 2025

This ANSI/CAN/UL Safety Standard consists of the First Edition.

The most recent designation of ANSI/UL 2252 as an American National Standard (ANSI) occurred on March 19, 2025. ANSI approval for a standard does not include the Cover Page, Transmittal Pages, Title Page, Preface or SCC Foreword.

This standard has been designated as a National Standard of Canada (NSC) on March 19, 2025.

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Preface

This is the First Edition of ANSI/CAN/UL 2252, Standard for Adapters for Use with Electric Vehicle Couplers.

ULSE is accredited by the American National Standards Institute (ANSI) and the Standards Council of Canada (SCC) as a Standards Development Organization (SDO).

This Standard has been developed in compliance with the requirements of ANSI and SCC for accreditation of a Standards Development Organization.

This ANSI/CAN/UL 2252 Standard is under continuous maintenance, whereby each revision is approved in compliance with the requirements of ANSI and SCC for accreditation of a Standards Development Organization. In the event that no revisions are issued for a period of four years from the date of publication, action to revise, reaffirm, or withdraw the standard shall be initiated.

Annex [A](#) is identified as Normative for Canada and Informative for the US. Informative text is for informational purposes only, and Normative text is considered to be mandatory.

In Canada, there are two official languages, English and French. All safety warnings must be in French and English. Attention is drawn to the possibility that some Canadian authorities may require additional markings and/or installation instructions to be in both official languages.

This First Edition joint American National Standard and National Standard of Canada is based on, and now supersedes, the First Issue Outline of Investigation UL 2252.

Comments or proposals for revisions on any part of the Standard may be submitted at any time. Proposals should be submitted via a Proposal Request in the Collaborative Standards Development System (CSDS) at <https://csds.ul.com>.

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This Edition of the Standard has been formally approved by the Technical Committee (TC) on plugs, receptacles, and couplers for electrical vehicles, TC 2251.

This list represents the TC 2251 membership when the final text in this standard was balloted. Since that time, changes in the membership may have occurred.

TC 2251 Membership

Name	Representing	Interest Category	Region
Mohamad Abdul-hak	Mercedes-Benz Research and Development	Supply Chain	USA
Joseph Bablo	UL Solutions	Testing & Standards Org.	USA
Keith Beckstead	EVgo	Commercial / Industrial User	USA
Theodore Bohn	Argonne National Laboratory	Government	USA
Ralph Buoniconti	SABIC	Supply Chain	USA

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Dan Cheddi	Electrical Safety Authority	Authorities Having Jurisdiction	Canada
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Gabriela Favaron	Seven Generation Capital Corp.	Commercial / Industrial User	Canada
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Hiroaki Fujioka	Chemitox INC	Testing & Standards Org.	Japan
Jun Haruhara	Polyplastics CO LTD	Supply Chain	Japan
Luis Ivan Hernandez	Ance A C AS Agent Only	Testing & Standards Org.	Mexico
John Holmes	American Honda Motor CO INC	General Interest	USA
Chad Kennedy	Schneider Electric USA, Inc.	Producer	USA
Thomas Kent	Eaton	Supply Chain	USA
Markus Kroner	Phoenix Contact / E-Mobility	Producer	Germany
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Jeff Lumetta	Yazaki North America INC	Producer	USA
Alex Marlow	General Motors	Supply Chain	USA
Andrew Meintz	National Renewable Energy Laboratory	Government	USA
Megan Monsen	UL Standards & Engagement	Project Manager	USA
Randy Narine	Energy Security Agency	General Interest	Canada
Cuong Nguyen	ABB E-MOBILITY	Supply Chain	USA
Gregory Nieminski	Gregory C Nieminski L L C	General Interest	USA
Christopher Pfaff	West Pierce Fire & Rescue	Authorities Having Jurisdiction	USA
Reginald Phillips	Vehicle Road Safety Solutions (VRSS)	Testing & Standards Org.	Canada
Padma Rao	Daimler Truck North America LLC	Commercial / Industrial User	USA
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Aimee Sinnott	UL Standards & Engagement	TC Chair	USA
Samuel Sudler III	SEA LTD	General Interest	USA
Arthur Sun	DEKRA Certification, Inc.	Testing & Standards Org.	Chinese Taipei
Luke Tao	Hua Zhen(Guang Zhou) Standards Technical Services Co., Ltd	Testing & Standards Org.	China
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Benny Varghese	Idaho National Laboratory	Government	USA
Sesha Yeruva	Siemens	Supply Chain	USA
Monther Zureigat	Webasto Charging Systems INC	Producer	USA

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This Standard is intended to be used for conformity assessment.

The intended primary application of this standard is stated in its scope. It is important to note that it remains the responsibility of the user of the standard to judge its suitability for this particular application.

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INTRODUCTION

1 Scope

1.1 This standard covers devices designated as adapters and integrated adapters for conductive EV power transfer to the vehicle. The devices are not used to convert voltages (e.g. AC to DC, DC to AC). These devices are only used to convert the physical configuration of the interfaces and provide for continued communication protocols. The devices covered by this standard are detailed in [1.2](#).

1.2 Devices covered by this standard include:

- a) Adapters or integrated adapters converting from one configuration to another where the communication protocol is the same between the infrastructure and the electric vehicle and additional functions may be provided;
- b) Adapters converting from one configuration to another where the communication protocol is different between the infrastructure and the vehicle, and the adapter provides a translation function, and additional functions may be provided; and
- c) Adapters that do not convert the configuration but provide additional functions that the infrastructure does not provide.

1.3 This standard does not cover devices that are used for any other purpose than as defined in [1.1](#) and [1.2](#). Devices for use in power export from the vehicle are not included in the purposes defined in [1.1](#) and [1.2](#).

1.4 This standard does not cover cable assemblies with an EV plug and an EV connector for connecting an EV socket-outlet to an EV vehicle inlet.

1.5 In relation to [1.2\(b\)](#), the translation function for the communication protocol is not covered by this standard.

1.6 This standard does not cover Vehicle Connectors or Vehicle Inlets which are covered under UL 2251, the Standard for Plugs, Receptacles, and Couplers for Electric Vehicles, and CSA C22.2 No. 282, the Standard for Plugs, Receptacles, and Couplers for Electric Vehicles.

1.7 This standard does not cover requirements for AC and DC pin sharing (overlay). The devices can be used for AC or DC but not both.

2 Components

2.1 A component of a product covered by this standard shall:

- a) Comply with the requirements for that component as specified in this standard;
- b) Be used in accordance with its rating(s) established for the intended conditions of use; and
- c) Be used within its established use limitations or conditions of acceptability.

2.2 A component of a product covered by this standard is not required to comply with a specific component requirement that:

- a) Involves a feature or characteristic not required in the application of the component in the product;

- b) Is superseded by a requirement in this standard; or
- c) Is separately investigated when forming part of another component, provided the component is used within its established ratings and limitations.

2.3 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.

2.4 A component that is also intended to perform other functions such as overcurrent protection, ground-fault circuit-interruption, surge suppression, any other similar functions, or any combination thereof, shall comply additionally with the requirements of the applicable standard(s) that cover devices that provide those functions.

3 Units of Measurement

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

4 Referenced Publications

4.1 Where reference is made to any standards, 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 referenced installation codes and standards noted below as appropriate.

ASTM D412, *Standard Test Methods for Vulcanized Rubber and Thermoplastic Elastomers – Tension*

CSA C22.1, *Canadian Electrical Code (CE Code)*

CSA C22.2 No. 0.15, *Adhesive Labels*

CSA C22.2 No. 0.17, *Evaluation of Properties of Polymeric Materials*

CSA C22.2 No. 0.2, *Insulation Coordination*

CSA C22.2 No. 0.8, *Safety Functions Incorporating Electronic Technology*

CSA C22.2 No. 14, *Industrial Control Equipment*

CSA C22.2 No. 65, *Wire Connectors*

CSA C22.2 No. 94.2, *Enclosures for Electrical Equipment, Environmental Considerations*

CSA C22.2 No. 280, *Electric Vehicle Supply Equipment*

CSA C22.2 No. 282, *Plugs, Receptacles, and Couplers for Electric Vehicles*

CSA C22.2 No. 332, *Electric Vehicle Cable*

CSA C22.2 No. 346, *DC Charging Equipment for Electric Vehicles*

IEC 61508-1, *Functional Safety of Electrical/Electronic/Programmable Electronic Safety-Related Systems – Part 1: General Requirements*

IEC 62196-2, *Plugs, Socket-Outlets, Vehicle Connectors and Vehicle Inlets – Conductive Charging of Electric Vehicles – Part 2: Dimensional Compatibility Requirements for AC Pin and Contact-Tube Accessories*

IEC 62196-3, *Plugs, Socket-Outlets, Vehicle Connectors and Vehicle Inlets – Conductive Charging of Electric Vehicles – Part 3: Dimensional Compatibility Requirements for DC and AC/DC Pin and Contact-Tube Vehicle Couplers*

IEC TS 62196-3-1, *Plugs, Socket-Outlets, Vehicle Connectors and Vehicle Inlets – Conductive Charging of Electric Vehicles – Part 3-1: Vehicle Connector, Vehicle Inlet and Cable Assembly for DC Charging Intended to be used with a Thermal Management System*

IEEE C37.09, *Test Procedures for AC High-Voltage Circuit Breakers with Rated Maximum Voltage Above 1000 V*

ISO 13849-1, *Safety of Machinery – Safety-Related Parts of Control Systems – Part 1: General Principles for Design*

ISO 13849-2, *Safety of Machinery – Safety-Related Parts of Control Systems – Part 2: Validation*

ISO 26262, *Road Vehicles – Functional Safety*

ISO 4521, *Metallic and other Inorganic Coatings – Electrodeposited Silver and Silver Alloy Coatings for Engineering Purposes – Specification and Test Methods*

NEMA ICS 2, *Industrial Control and Systems Controllers, Contactors and Overload Relays Rated 600 Volts*

NFPA 70, *National Electrical Code*

SAE J1772™, *SAE Electric Vehicle and Plug-In Hybrid Electric Vehicle Conductive Charge Coupler*

SAE J3068, *Electric Vehicle Power Transfer System Using a Three-Phase Capable Coupler*

SAE J3400, *NACS Electric Vehicle Coupler*

UL 50E, *Enclosures for Electrical Equipment, Environmental Considerations*

UL 94, *Tests for Flammability of Plastic Materials for Parts in Devices and Appliances*

UL 486E, *Equipment Wiring Terminals for Use with Aluminum and/or Copper Conductors*

UL 508, *Industrial Control Equipment*

UL 746A, *Polymeric Materials – Short Term Property Evaluations*

UL 746B, *Polymeric Materials – Long Term Property Evaluations*

UL 746C, *Polymeric Materials – Use in Electrical Equipment Evaluations*

UL 840, *Insulation Coordination Including Clearances and Creepage Distances for Electrical Equipment*

UL 969, *Marking and Labeling Systems*

UL 969A, *Marking and Labeling Systems – Flag Labels, Flag Tags, Wrap-Around Labels and Related Products*

UL 991, *Tests for Safety-Related Controls Employing Solid-State Devices*

UL 1439, *Tests for Sharpness of Edges on Equipment*

UL 1998, *Software in Programmable Components*

UL 2202, *DC Charging Equipment for Electric Vehicles*

UL 2251, *Plugs, Receptacles, and Couplers for Electric Vehicles*

UL 2263, *Electric Vehicle Cable*

UL 2594, *Electric Vehicle Supply Equipment*

5 Glossary

5.1 For the purpose of this Standard the following definitions apply.

5.2 ADAPTER – A physical piece of equipment consisting of an infrastructure interface and a vehicle interface, which may be separated by a length of cable.

5.3 DEVICE – this term is used when indicating both an adapter or an integrated adapter. If a specific requirement applies to only an adapter, or only an integrated adapter, then this will be specifically mentioned.

5.4 EMERGENCY SHUTDOWN – The state that an EVSE or EV transitions to in the event of a hazardous fault condition. In this state an EVSE or EV will restrict energization or energy flow such that hazards of fire or electrical shock are prevented.

5.5 INFRASTRUCTURE INTERFACE – The portion of the device that mates with the vehicle connector.

5.6 INTEGRATED ADAPTER – An adapter that is provided as an integral part of an EVSE such that it cannot be removed from the charging location. The device will be locked to the vehicle connector when in use or stored in the EVSE when not in use.

5.7 VEHICLE INTERFACE – The portion of the device that mates with the vehicle inlet.

CONSTRUCTION

6 General

6.1 Devices shall be so constructed as to meet all requirements of this standard. All devices shall be subjected to the applicable tests in this standard based on the configurations included and the intended functionality. All devices are complete products and shall not require wiring, or any other modification, in the field.

6.2 This standard addresses devices that contain the following configurations. The configuration used shall meet the indicated standard including all peripheral aspects such as retaining means, latching means, and interlocks. Devices are not allowed to make and break under load during normal operation. Devices are only intended for use with infrastructure equipment that is shown to comply with UL 2202 and CSA C22.2 No. 346 or UL 2594 and CSA C22.2 No. 280.

- a) Type 1 – As described in SAE J1772 and IEC 62196-2;
- b) Type 2 – As described in IEC 62196-2 or SAE J3068;
- c) North American Charging Standard (NACS) – As described in SAE J3400;
- d) CHAdeMO – Configuration AA as described in IEC 62196-3;
- e) CCS1 – Configuration EE as described in IEC 62196-3; and
- f) CCS2 – Configuration FF as described in IEC 62196-3.

6.3 Due to the severity of consequences of a “live disconnection” event, DC devices shall be designed with interlocking means on the infrastructure interface and the vehicle interface to mechanically mitigate the risk of disconnection during an active charging session.

6.4 The interlocking means shall be able to detect and/or monitor the status of the latching/locking means and prevent a charging session from starting if not properly engaged, or immediately signal an emergency shut down should either side of the device become disengaged during an active charge session.

6.5 Integrated adapters shall have an automatic interlocking means that retains the adapting device on the connector when the adapter is deployed, or retains the adapting device on or within the EVSE when not deployed, to prevent misuse of integrated adapters. This automatic interlocking system shall have a means of identifying that the interlocking mechanism between the connector and adapting device is properly engaged prior to releasing the adapting device from the EVSE.

6.6 Devices covered by this standard are to be two halves – the infrastructure interface and the vehicle interface – joined into one integral piece. Each interface is provided with one of the configurations from [6.2](#). Devices with cable in between the interfaces are allowed. The cable shall be suitably rated for the voltage involved and sized according to the rating of the device. The cable shall comply with the requirements of UL 2263 and CSA C22.2 No. 332. For adapters with cable in excess of 300 mm (12 inches), the mating face for the infrastructure interface, when mated with the applicable vehicle connector, shall be able to meet the enclosure rating in accordance with Environmental considerations, [7.6](#).

6.7 Adapters and integrated adapters shall be provided with a voltage and current rating. As adapters can be used provided the configurations match the infrastructure connector or the vehicle inlet, there is no protective measure in place to prevent an adapter with an insufficient rating from being used on any equipment or any vehicle. Therefore, all adapters shall be provided with thermal controls that will shut down the flow of current, or terminate the charge session, before temperatures on the power contacts reach the maximum temperature limits for the contacts. The thermal sensing circuit shall include at least two thermal sensors, both capable of independently causing the thermal control system to open the circuit. This thermal control system shall be shown to comply with the applicable tests in Thermal Control Verification Tests, Section [41](#). As integrated adapters are intended to be provided with specific charging system equipment, thermal control systems are not required. If integrated adapters are provided with thermal control systems, those systems shall comply with the applicable tests in Thermal Control Verification Tests, Section [41](#).