UL 1682

STANDARD FOR SAFETY

Plugs, Receptacles, and Cable Connectors of the Pin and Sleeve Type

UL Standard for Safety for Plugs, Receptacles, and Cable Connectors of the Pin and Sleeve Type, UL 1682

Fifth Edition, Dated February 15, 2017

SUMMARY OF TOPICS

This revision of ANSI/UL 1682 dated March 28, 2024 expands requirements for Weather-Resistant Receptacles; 3.2.2, Supplement SA, and Supplement SC.

The revised requirements are substantially in accordance with Proposal(s) on this subject dated July 14, 2023 and November 3, 2023.

Text that has been changed in any manner or impacted by ULSE's electronic publishing system is marked with a vertical line in the margin.

No Text on This Page

Association of Standardization and Certification
NMX-J-719-ANCE
First Edition

CSA Group
CSA C22.2 No. 182.1:17
Fifth Edition

ULSE Inc.
UL 1682
Fifth Edition

Plugs, Receptacles, and Cable Connectors of the Pin and Sleeve Type

February 15, 2017

(Title Page Reprinted: March 28, 2024)

ANSI/UL 1682-2024

Commitment for Amendments

This standard is issued jointly by the Association of Standardization and Certification (ANCE), the Canadian Standards Association (operating as “CSA Group”), and ULSE Inc. (ULSE). Comments or proposals for revisions on any part of the standard may be submitted to ANCE, CSA Group, or ULSE at anytime. Revisions to this standard will be made only after processing according to the standards development procedures of ANCE, CSA Group, and ULSE. CSA Group and ULSE will issue revisions to this standard by means of a new edition or revised or additional pages bearing their date of issue. ANCE will incorporate the same revisions into a new edition of the standard bearing the same date of issue as the CSA Group and ULSE pages.

ISBN 978-1-4883-0379-1 © 2017 Canadian Standards Association

This Standard is subject to review within five years from the date of publication, and suggestions for its improvement will be referred to the appropriate committee. To submit a proposal for change, please send the following information to inquiries@csagroup.org and include "Proposal for change" in the subject line: Standard designation (number); relevant clause, table, and/or figure number; wording of the proposed change; and rationale for the change.

To purchase CSA Group Standards and related publications, visit CSA Group's Online Store at www.csagroup.org/store/ or call toll-free 1-800-463-6727 or 416-747-4044.

This ANSI/UL Standard for Safety consists of the Fifth Edition including revisions through March 28, 2024. The most recent designation of ANSI/UL 1682 as an American National Standard (ANSI) occurred on March 28, 2024. ANSI approval for a standard does not include the Cover Page, Transmittal Pages, Title Page (front and back), or the Preface.

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

For information on ULSE Standards, visit http://www.shopulstandards.com, call toll free 1-888-853-3503 or email us at ClientService@shopULStandards.com.

CONTENTS

No Text on This Page

Preface

This is the harmonized ANCE, CSA Group, and ULSE Standard for Plugs, Receptacles, and Cable Connectors of the Pin and Sleeve Type. It is the First edition of NMX-J-719-ANCE, the Fifth edition of CSA C22.2 No. 182.1, and the Fifth edition of UL 1682. This edition of CSA-C22.2 No. 182.1 supersedes the previous edition published in February 2014. This edition of UL 1682 supersedes the previous edition published on February 7, 2014. This harmonized standard has been jointly revised on March 28, 2024. For this purpose, CSA Group and ULSE are issuing revision pages dated March 28, 2024, and ANCE is issuing a new edition dated March 28, 2024.

This harmonized Standard was prepared by the Association of Standardization and Certification, (ANCE), CSA Group, and ULSE Inc. (ULSE).

The efforts and support of the Technical Harmonization Subcommittee, 23H, on the Harmonization of Electrotechnical Standards of the Nations of the Americas (CANENA), 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 developed by the CT 23 – Accesorios eléctricos (Artefactos eléctricos) from the Comite de Normalizacion de la Asociacion de Normalizacion y Certificacion, A.C., CONANCE, with the collaboration of the plugs, receptacles and conductors manufacturers and users.

This Standard was reviewed by the CSA Integrated Committee on Wiring Devices under the jurisdiction of the CSA Technical Committee on Wiring 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 developed in compliance with the Standards Council of Canada requirements for National Standards of Canada. It has been published as a National Standard of Canada by CSA Group.

Application of Standard

Where reference is made to a specific number of samples 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 is published as an equivalent Standard.

An equivalent Standard is a Standard that is substantially the same in technical content, except as follows. Technical deviations are allowed for Codes and Government Regulations and 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

There is no corresponding IEC standard.

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.

1 Scope

1.1 This standard applies to pin and sleeve type plugs, receptacles, power inlets, and connectors, rated up to 800 amperes and up to 600 volts ac or dc, and which may include up to eight pilot contacts. These devices are intended to provide power from branch circuits, or are for direct connection to the branch circuit in accordance with the Canadian Electrical Code Part I, the National Electrical Code (NEC), ANSI/NFPA 70, and the Mexican Electrical Code, NOM 001 SEDE, using copper conductors, for use in either indoor or outdoor nonhazardous locations. In Canada, the terminals of a device intended to accommodate aluminum conductors also comply with CSA C22.2 No. 65.

1.2 This standard does not apply to single conductor pin and sleeve devices. Single pole locking-type separable connectors are covered by CSA C22.2 No. 1691/UL 1691.

1.3 This standard does not apply to:

a) Devices molded integrally with flexible cord or cable that are covered by UL 817, CSA C22.2 No. 21, and NMX-J-195-ANCE;

b) General and special use devices, such as attachment plugs, receptacles, cord connectors, inlets, current taps, flatiron and appliance plugs, that are covered by UL 498, CSA C22.2 No. 42, CSA C22.2 No. 57, CSA C22.2 No. 182.2, NMX-J-412-ANCE, NMX-J-412/2-1-ANCE, NMX-J-412/2-2-ANCE, NMX-J-412/2-3-ANCE, NMX-J-412/2-4-ANCE, NMX-J-412/2-5-ANCE, and NMX-J-412/2-6-ANCE;

c) Single and multi-pole connectors intended for connection to copper conductors, for use in data, signal, control and power applications within and between electrical equipment, where exposed, that are covered by UL 1977 and CSA C22.2 No. 182.3;

d) Devices intended for use in hazardous (Classified) locations that are covered by UL 1203 and CSA C22.2 No. 159; and

e) Products such as switched interlocks that are covered by UL 508 and CSA C22.2 No. 14.

2 Definitions

2.1 For the purposes of this standard, the following definitions apply.

2.2 CONNECTOR (CABLE CONNECTOR) – A portable receptacle that is intended to provide power, with means for attachment of flexible cord or cable and not intended for permanent mounting.

2.3 CONTACT – A conductive element in a component that mates with a corresponding element to provide an electrical path.

2.4 CONTACT, PILOT – A conductive element intended to carry an indicating or controlling signal.

2.5 DELAYED ACTION – An arrangement that delays the separation of device housings which is intended to reduce the likelihood of exposure of arcing contacts during the breaking of the circuit when the plug is withdrawn.

2.6 ENCLOSURE – The case or housing into which the insulator and contacts are assembled. The enclosure system can be composed of elements such as outlet boxes, mounting panels, receptacles, plugs, and connectors.

2.7 GROUNDING/BONDING CONDUCTOR – In the U.S. and Mexico, a conductor that is defined in the National Electrical Code (NEC), ANSI/NFPA 70, and the Mexican Electrical Code, NOM 001 SEDE, as an

Equipment Grounding Conductor, and in Canada, a conductor that is defined in the Canadian Electrical Code Part I, C22.1, as a Bonding Conductor.

2.8 GROUNDING/BONDING PATH – A path between the grounding/bonding pin, or contact and the grounding/bonding terminal or, if the device has no grounding/bonding terminal, the point at which the path makes contact with a part of the metal raceway system, such as a box, box cover, or the raceway itself.

2.9 GROUNDING/BONDING TYPE DEVICE – A device having a grounding/bonding path.

2.10 INSULATION, ELECTRICAL – The insulation necessary for the proper functioning of the product and for basic protection against electrical shock.

2.11 INSULATOR – That portion of a device that provides for separation and support of contacts.

2.12 INTERLOCKED RECEPTACLE (OUTLET) – An outlet having a device, either electrical or mechanical, that is intended to reduce the likelihood of energizing the contacts before proper engagement with the plug, and that either is intended to reduce the risk of the plug being withdrawn while its contacts are energized or deenergizes the line contacts before separation.

2.13 LOCKING RETAINING MEANS – A mechanical arrangement that holds a plug or connector in position when it is in proper engagement and is intended to reduce the likelihood of its unintentional withdrawal. It can also facilitate environmental sealing.

2.14 MOTOR RATING – In Canada and the United States, a rating expressed in horsepower (hp) and/or full load locked-rotor current and voltage assigned to a device that is intended to control a motor load.

In Mexico, a rating expressed in horsepower (hp) /kilowatts (kW) and/or full load locked-rotor current and voltage assigned to a device that is intended to control a motor load.

2.15 PIN AND SLEEVE DEVICE – A plug, receptacle, power inlet, or connector utilizing contacts that generally are cylindrical or circular and telescoping and are shrouded by an extension of the enclosure of the mating devices.

2.16 PLUG (ATTACHMENT PLUG) – A device intended to receive power when inserted in a receptacle or connector, which establishes connection between conductors of the attached flexible cord or cable and the conductors connected to the receptacle or cable connector.

2.17 POWER INLET – A permanently mounted plug intended to receive power from a cable connector.

2.18 RECEPTACLE (OUTLET) – A device that is intended to provide power to an inserted plug, and that is installed as a fixed outlet or on equipment.

2.19 SWITCHED RECEPTACLE – An outlet with an associated or integral switching device to disconnect the supply from the receptacle contacts.

2.20 TERMINAL – A conductive part provided on a contact for connecting a conductor.

2.21 TERMINAL, CRIMP TYPE – A terminal in which an electro-mechanical connection is made between the terminal lug and a conductor by compressing the lug onto the conductors.

2.22 TERMINAL, FIELD WIRING – A terminal to which power supply, load, control, or grounding/bonding connections will be made in the field when the device is installed.

2.23 TERMINAL, INSULATION-DISPLACEMENT – A terminal having a contacting member that forces the conductor insulation aside and presses against the side of the conductor to make contact.

2.24 TERMINAL, PIN-TYPE (INSULATION-PIERCING) – A terminal having a contact pin that punctures the conductor insulation to contact the current-carrying conductor.

2.25 TERMINAL, PRESSURE-WIRE – A terminal in which the conductor is clamped under a pressure plate or saddle by one or more screws or nuts.

2.26 TERMINAL, SET SCREW – A terminal in which the clamping pressure is applied by the end of the screw bearing directly on the conductor.

2.27 TERMINAL, WIRE-BINDING SCREW – A terminal in which the conductor is bent around the screw and is clamped directly under the head of the screw when it is tightened.

3 General

3.1 Components

3.1.1 Except as indicated in Clause 3.1.2, a component of a product covered by this standard shall comply with the requirements for that component. See Annex A for a list of standards covering components generally used in the products covered by this standard. A component shall comply with the ANCE, CSA or UL standards as appropriate for the country where the product is to be used.

3.1.2 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.

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

3.1.4 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.

3.1.5 For products intended for use in Canada, general requirements are given in CAN/CSA-C22.2 No. 0, General Requirements – Canadian Electrical Code, Part II.

3.2 Reference publications

3.2.1 Products covered by this standard shall comply with the reference installation codes and standards 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.

3.2.2 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.

ANCE Standards

NOM 001 SEDE,
Mexican Electrical Code

NMX-J-005-ANCE-2005,
General Use Switches for Fixed Electrical Installations – General Requirements and Test Methods

NMX-J-009/4248/1-ANCE-2009,
Low Voltage Fuseholders – Part 1: General Requirements

NMX-J-009/4248/4-ANCE-2009,
Low Voltage Fuseholders – Part 4: Fuseholders Class CC

NMX-J-009/4248/5-ANCE-2009,
Low Voltage Fuseholders – Part 5: Fuseholders Class G

NMX-J-009/4248/6-ANCE-2009,
Low Voltage Fuseholders – Part 6: Fuseholders Class G

NMX-J-009/4248/8-ANCE-2009,
Low Voltage Fuseholders – Part 8: Fuseholders Class J

NMX-J-009/4248/9-ANCE-2009,
Low Voltage Fuseholders – Part 9: Fuseholders Class K

NMX-J-009/4248/11-ANCE-2007,
Fuseholders – Part 11: Type C (Edison Base) and Type S Plug Fuse

NMX-J-009/4248/12-ANCE-2009,
Low Voltage Fuseholders – Part 12: Fuseholders Class R

NMX-J-009/4248/15-ANCE-2009,
Low Voltage Fuseholders – Part 15: Fuseholders Class T

NMX-J-162-ANCE-2014,
Enclosed and Dead-Front Switches

NMX-J-195-ANCE-2006,
Power Supply Cords and Extension Cord Sets for Electrical Appliances – Specifications and Test Methods

NMX J 235/2-ANCE-2014,
Enclosures – Enclosures for Electrical Equipment, Environmental Considerations

NMX-J-266-ANCE-2014,
Molded-Case Circuit Breakers, Molded-Case Switches and Circuit-Breaker Enclosures

NMX-J-412-ANCE-2008,
Attachment Plugs and Receptacles – General Specifications and Test Methods

NMX-J-412/2-1-ANCE-2008,
Attachment Plugs – Specifications and Test Methods

NMX-J-412/2-2-ANCE-2008,
Receptacles – Specifications and Test Methods

NMX-J-412/2-3-ANCE-2009,
Cord Connectors – Specifications and Test Methods

NMX-J-412/2-4-ANCE-2009,
Current Taps and Adapters – Specifications and Test Methods

NMX-J-412/2-5-ANCE-2009,
Flat Iron and Appliance Plugs – Specifications and Test Methods

NMX-J-412/2-6-ANCE-2009,
Hospital Grade Devices – Specifications and Test Methods

NMX-J-515-ANCE-2008,
Distribution and Control Equipment – Safety General Requirements - Specifications and Test Methods

NMX-J-565-ANCE-2004,
Safety Requirements – Humidity Conditioning - Test Conditioning

NMX-J-565/2-10-ANCE-2010,
Fire Hazard Testing – Part 2-10: Glowing / Hot-Wire Based

NMX-J-565/3-ANCE-2006,
Safety Requirements – Flammability of Plastic Materials for Parts in Devices and Appliances – Test Methods

NMX-J-565/6-ANCE-2007,
Safety requirements – Hot wire resistance to ignition – Test method

NMX-J-565/7-ANCE-2007,
Safety requirements – High-current arc resistance to ignition – Test method

NMX-J-597/1-ANCE-2007,
Insulation Coordination for Equipment within Low Voltage Systems – Part 1: Principles, Requirements and Tests

NMX-T-024-SCFI,
Rubber Industry – Determination of Shore "A" Hardness – Tests Methods

NMX-T-144-SCFI,
Rubber Industry – Raw Materials – Softening Point – Ring and Ball Test Method

CSA Group Standards

C22.1-15,
Canadian Electrical Code, Part I

CAN/CSA-C22.2 No. 0-10 (R2015),
General Requirements – Canadian Electrical Code, Part II

C22.2 No. 0.2-16,
Insulation Coordination

CAN/CSA-C22.2 No. 0.4-04 (R2013),
Bonding of Electrical Equipment

C22.2 No. 0.15-15,
Adhesive Labels

CAN/CSA-C22.2 No. 0.17-00 (R2013),
Evaluation of Properties of Polymeric Materials

C22.2 No. 4-16,
Enclosed and Dead-Front Switches

C22.2 No. 5-16,
Molded-Case Circuit Breakers, Molded-Case Switches and Circuit-Breaker Enclosures

C22.2 No. 14-13,
Industrial Control Equipment

C22.2 No. 21-14,
Cord Sets and Power Supply Cords

C22.2 No. 42-10,
General Use Receptacles, Attachment Plugs, and Similar Wiring Devices

C22.2 No. 57-15,
Appliance Plugs for Heater Cord Sets

C22.2 No. 65-13,
Wire Connectors

CAN/CSA-C22.2 No. 94-M91 (R2011),
Special Purpose Enclosures

C22.2 No. 94.2-15,
Enclosures for Electrical Equipment, Environmental Considerations

C22.2 No. 111-10 (R2015),
General-Use Snap Switches

C22.2 No. 158-10 (R2014),
Terminal Blocks

C22.2 No. 159-M1987 (R2014),
Attachment Plugs, Receptacles, and Similar Wiring Devices for Use in Hazardous Locations, Class I, Groups A, B, C, and D; Class II, Group G, in Coal or Coke Dust, and in Gaseous Mines

C22.2 No. 182.2-M1987 (R2014),
Industrial Locking Type, Special Use Attachment Plugs, Receptacles and Connectors

C22.2 No. 182.3-M1987 (R2014),
Special Use Attachment Plugs, Receptacles and Connectors

C22.2 No. 1691-12,
Single Pole Locking-Type Separable Connectors

CAN/CSA-C22.2 No. 4248-1-07 (R2012),
Fuseholders – Part 1: General Requirements

CAN/CSA-C22.2 No. 4248-4-07 (R2012),
Fuseholders – Part 4: Class CC

CAN/CSA-C22.2 No. 4248-5-07 (R2012),
Fuseholders – Part 5: Class G

CAN/CSA-C22.2 No. 4248-6-07 (R2012),
Fuseholders – Part 6: Class H

CAN/CSA-C22.2 No. 4248-8-07 (R2012),
Fuseholders – Part 8: Class J

CAN/CSA-C22.2 No. 4248-9-07 (R2012),
Fuseholders – Part 9: Class K

CAN/CSA-C22.2 No. 4248-11-07 (R2012),
Fuseholders – Part 11: Type C (Edison Base) and Type S Plug Fuse

CAN/CSA-C22.2 No. 4248-12-07 (R2012),
Fuseholders – Part 12: Class R

CAN/CSA-C22.2 No. 4248-15-07 (R2012),
Fuseholders – Part 15: Class T

UL Standards

UL 20
General-Use Snap Switches

UL 50E
Enclosures for Electrical Equipment, Environmental Considerations

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

UL 98
Enclosed and Dead-Front Switches

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

UL 489
Molded-Case Circuit Breakers, Molded-Case Switches, and Circuit-Breaker Enclosures

UL 498
Attachment Plugs and Receptacles

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 817
Cord Sets and Power-Supply Cords

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

UL 969
Marking and Labeling Systems

UL 1203
Explosion-Proof and Dust-Ignition-Proof Electrical Equipment for Use in Hazardous (Classified) Locations

UL 1686
Pin and Sleeve Configurations

UL 1691
Single Pole Locking-Type Separable Connectors

UL 1977
Component Connectors for Use in Data, Signal, Control and Power Applications

UL 4248-1
Fuseholders – Part 1: General Requirements

UL 4248-4
Fuseholders – Part 4: Class CC

UL 4248-5
Fuseholders – Part 5: Class G

UL 4248-6
Fuseholders – Part 6: Class H

UL 4248-8
Fuseholders – Part 8: Class J