National Differences For

UL 60335-1

Safety of Household and Similar Appliances, Part 1: General Requirements

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UL 60335-1 is an adoption of IEC 60335-1, Safety Standard for of Household and Similar Electrical Appliances, Part 1: General Requirements, (Edition 4.2, Issued by the IEC September 2006). Please note that the national difference document incorporates all of the U.S. national differences for UL 60335-1.

This document provides a single listing of the National Differences included in the UL adoption of the corresponding IEC standard.

Preface

This document provides a single listing of the technical National Differences included in the UL adoption of the corresponding IEC standard.

In its IEC-based standards, UL uses the notations indicated below to identify national difference type, and these types are additionally noted in this document. The standard may not use all types of these deviations.

D1 - These are deviations which are based on basic safety principles and requirements, elimination of which would compromise safety for U.S. consumers and users of products.

D2 - These are deviations based on safety practices. These are deviations for IEC requirements that may be acceptable, but adopting the IEC requirements would require considerable retesting or redesign on the manufacturer's part.

DC - These are deviations based on the component standards and will not be deleted until a particular component standard is harmonized with the IEC component standard.

DE - These are deviations based on editorial comments or corrections.

DR - These are deviations based on the national regulatory requirements.

Each national difference contains a description of what the national difference entails. Typically one of the following words is used to explain how the text of the national difference is to be applied to the base IEC text:

Addition / Add - An addition entails adding a complete new numbered clause, subclause, table, figure, or annex. Addition is not meant to include adding select words to the base IEC text.

Deletion / Delete - A deletion entails complete deletion of an entire numbered clause, subclause, table, figure, or annex without any replacement text.

Modification / Modify - A modification is an altering of the existing base IEC text such as the addition, replacement or deletion of certain words or the replacement of an entire clause, subclause, table, figure, or annex of the base IEC text.

National Differences

2DV.1 DR *Addition:*

This standard is applicable to household and similar electrical appliances and equipment which are designed to be installed in accordance with relevant installation codes: National Electrical Code (NEC) ANSI/NFPA 70; or CSA C22.1 Canadian Electrical Code (CEC) Part I; or Mexican Electrical Installations NOM-001-SEDE.

2DV.2 DC *Addition:*

Certain IEC component standard requirements are replaced by the relevant requirements of component standards, examples of which are listed in Annex DVA.

2DV.3 DR *Addition:*

In Mexico, international standards are informative. For the relevant applicable standard in each clause, see annex DVB.

2DV.4 DE *Addition:*

Add the following normative reference:

ISO 9773,
Plastics – Determination of burning behaviour of thin flexible vertical specimens in contact with a small-flame ignition source

3.4.1DV DR *Modification to replace the definition with the following:*

EXTRA-LOW VOLTAGE: Voltage that does not exceed 30 V rms or 42,4 V peak ac or dc.

3.4.2DV DR *Modification to replace the first paragraph with the following:*

SAFETY EXTRA-LOW VOLTAGE: Voltage not exceeding 30 V rms or 42,4 V peak or 30 V dc between conductors and between conductors and earth. Where an appliance is intended for use immersed in water, SAFETY EXTRA-LOW VOLTAGE is 15 V rms or 21,2 V peak or 15 V dc.

3.6.4DV DE *Modification to add the following note:*

NOTE 3 A LIMITED POWER SOURCE is not considered to be LIVE PARTS.

3.10DV D2 *Addition:*

LIMITED POWER SOURCE: A power source whose output voltage is SELV and the maximum output current and other parameters are limited in accordance with Table 3.10DV.1.

Table 3.10DV.1 – Limits for inherently LIMITED POWER SOURCES

Output voltage[1] (U_{OC})		Output current[2] (I_{SC})	Apparent power[3] (S)
V a.c.	V d.c.	A	VA
≤ 20	≤ 20	≤ 8,0	≤ 5 × U_{OC}
20 < U_{OC} ≤ 30	20 < U_{OC} ≤ 30	≤ 8,0	≤ 100
–	30 < U_{OC} ≤ 42,4	≤ 150 /U_{OC}	≤ 100

[1] U_{OC}: Output voltage measured with all load circuits disconnected. Voltages are for substantially sinusoidal a.c. and ripple free d.c. For non-sinusoidal a.c. and d.c. with ripple greater than 10% of the peak, the peak voltage shall not exceed 42,4 V.

[2] I_{SC}: Maximum output current with any non-capacitive load, including a short circuit measured 5 s after application of the load if the limited power circuit is protected by an electronic circuit or a PTC and 60 s if protected by an impedance.

[3] S (VA): Maximum output VA with any load. Initial transients lasting less than 5 s are permitted to exceed the limit if the limited power circuit is protected by an electronic circuit or a PTC and 60 s if protected by an impedance.

3.11DV D2 *Addition:*

PROTECTIVE EARTHING CONDUCTOR: **A conductor connecting the main protective earthing terminal or lead in the equipment to the building earth, or in the power SUPPLY CORD, connecting a main protective earthing terminal in the equipment to an earth point in the building installation.**

3.12DV D2 *Addition:*

PROTECTIVE BONDING CONDUCTOR: **A conductor in the equipment, or a combination of conductive parts in the equipment, connecting a main protective earthing terminal to a part of the equipment that is required to be earthed.**

4DV DE *Modification of the first paragraph:*

Replace "cause no danger to persons or surroundings." with "reduce the risk of fire, electric shock, and/or injury to persons."

6.1DV.1 DR *Modification to add the following:*

Class 0I **appliances are not allowed.**

NOTE Class 0I may be allowed if specified in the applicable part 2.

6.1DV.2 DR *Modification to add the following:*

CLASS 0 **appliances shall not exceed 150 volts (rms) to ground.**

7.1DV.1 D2 *Modification to add the following note:*

NOTE 5 Where IP numbers are required to be marked, alternate markings may be used. Where the alternate markings are used, compliance with 6.2 is determined by the applicable part 2.

7.1DV.2 DR *Modification to add the following paragraph and notes after the last paragraph:*

If the temperature rise of the insulation of the fixed wiring supplying an appliance for permanent connection to the supply mains exceeds the temperature rise specified in Table 3 during the test of Clause 11, the equipment shall be marked with the substance of the following:

"Use supply wires suitable for ____ °C"

NOTE 6 The temperature specified in the marking will be 75°C or 90°C except where another rating is permitted by national electrical installation code wiring rules.

NOTE 7 Additional information (e.g. AWG size) may be provided as part of the marking where appropriate to facilitate installation in accordance with the national electrical installation code wiring rules.

Compliance is checked by inspection and during the test of Clause 11.

7.8DV DR *Modification to add the following note:*

NOTE The marking of the letter N for the neutral conductor terminal is not required for Type Y attachments.

7.12.3DV DR *Deletion:*

Delete Clause 7.12.3.

7.14DV D2 *Modification to delete Note 2 and add the following to the end of the first paragraph of the test specification:*

The petroleum sprit to be used for the test is aliphatic solvent hexane.

7.17DV DR *Addition:*

Appliances requiring the usage of time delay overcurrent protective devices in accordance with 9DV.2 shall be so marked to indicate the use of time delay fuses only.

7.18DV DR *Addition:*

Appliances equipped with output terminals supplied from a LIMITED POWER SOURCE shall be marked to indicate Class 2 wiring.

8.1.1DV D1 *Modification to add the following after the third paragraph:*

The articulated probe of Figure 12DV shall be applied without appreciable force when the product is:

a) A hand-held product, or a hand-held part of a product, or

b) Accessible to children while the product is operating.

9DV DR *Addition of 9DV.1 – 9DV.4:*

9DV.1 An appliance shall start and operate on a circuit protected by a non-time delay fuse having a current rating corresponding to the supply mains to which the appliance would normally be connected.

9DV.2 The use of time delay fuses is acceptable for stationary appliances marked as indicated in Clause 7.17DV.

9DV.3 Compliance is checked by the test specified in 9DV.4

9DV.4 The appliance shall be capable of starting 3 times at the conditions of Clause 11 at the rated voltage. The appliance shall start under conditions representing the beginning of normal operation and the beginning of the normal operating cycle. The performance is unacceptable if the fuse opens or an overload protector provided as part of the appliance operates.

11.8DV DC *Modification to revise Table 3 as specified in 11.8DV.1 – 11.8DV.6:*

11.8DV.1 Change temperature rise for "Points where the insulation of the wires can come into contact with parts of the terminal block or compartment for fixed wiring, for stationary appliances not provided with a supply cord" to 35K.

11.8DV.2 Change temperature rise for "Material used as insulation, other than that specified for wires and windings[e]: impregnated or varnished textile, paper or press-board" from 70 to 65.

11.8DV.3 Change temperature rise for "–polytetrafluoroethylene" from 265 to 180.

11.8DV.4 Replace footnote "c" with the following:

[c]This limit may be exceeded if the marking specified in 7.1DV.1 is supplied.

11.8DV.5 Add footnote k:

[k]Maximum temperature rise for RTV silicone rubber is 105°.

11.8DV.6 Add footnote l:

[l]The maximum temperature rise of parts in contact with oil should be considered in the applicable part 2.

13.1DV.1 D1 *Modification to replace the last paragraph with the following:*

Protective impedance and radio interference filters shall not be disconnected before carrying out the tests.

13.1DV.2 D1 *Modification to add the following note:*

NOTE At operating temperature includes warm-up and cool-down periods.

13.2DV.1 D1 *Modification to replace all the dashed items of the 6th paragraph with the following dashed items:*

- for CLASS II APPLIANCES	0,25 mA
- for CLASS 0, CLASS 0I AND CLASS III APPLIANCES	0,5 mA
- for portable CLASS I APPLIANCES	0,75 mA
- for all cord connected STATIONARY APPLIANCES	0,75 mA
- for other STATIONARY CLASS I MOTOR-OPERATED APPLIANCES	3,5mA
- for other STATIONARY CLASS I HEATING APPLIANCES	0,75 mA or 0,75 mA per kW rated power input of the appliance with a maximum of 5 mA, whichever is higher

13.2DV.2 D2 *Modification to add the following 9th paragraph:*

For a cord connected product employing a sheathed type heating element, the leakage current may exceed 0,5 mA or 0,75 mA, as applicable, but shall not exceed 2,5 mA during a period of 5 minutes beginning when the 0,5 mA or 0,75 mA value was exceeded. At the end of the 5 minute period, the leakage current shall not exceed 0,5 mA or 0,75 mA, as applicable.

13.2DV.3 D1 *Modification to add the following 10th paragraph:*

For heating appliances incorporating a user adjustable heater control, the control shall be additionally adjusted, if necessary, so that it interrupts operation while the final measurements are taken.

13.2DV.4 D1 *Modification to add the following note after Note 4:*

NOTE 5 Higher leakage current values, not exceeding 3.5mA, may be allowed by the applicable part 2 standards for Class 1 appliances employing radio interference filters.

13.3DV.1 D1 *Modification to replace footnote "a" of Table 4 with the following:*

[a]Appliances rated more than 250 V are tested at 2 U + 1000 V.

13.3DV.2 D1 *Modification to add footnote "c" to Table 4 and add superscript "c" after "Basic insulation":*

[c]For wet and moist applications, special test voltages could be considered in the applicable part 2.

15.1.1DV DR *Modification to add the following note:*

NOTE For use in other than indoor ordinary locations, appliances may need to be evaluated in accordance with the alternative standards (Standard for Enclosures for Electrical Equipment, UL 50, Special Purpose Enclosures, CAN/CSA C22.2 No. 94, and NMX-J-529-ANCE).

16.1DV D1 *Modification to replace the 3rd paragraph with the following.*

Protective impedance and radio interference filters shall not be disconnected before carrying out the tests.

16.2DV.1 D2 *Modification of the third dashed item in 5th paragraph.*

Delete the second sentence "In this case the leakage current with the filter disconnected shall not exceed the limits specified."

16.2DV.2 D1 *Replace all the dashed items of the 4th paragraph with the following dashed items:*

- for CLASS II APPLIANCES	*0,25 mA*
- for CLASS 0, CLASS 0I AND CLASS III APPLIANCES	*0,5 mA*
- for portable CLASS I APPLIANCES	*0,75 mA*
- for all cord connected STATIONARY APPLIANCES	*0,75 mA*
- for other STATIONARY CLASS I MOTOR-OPERATED APPLIANCES	*3,5mA*
- for other STATIONARY CLASS I HEATING APPLIANCES	*0,75 mA or 0,75 mA per kW rated power input of the appliance with a maximum of 5 mA, whichever is higher*

16.2DV.3 D2 *Modification to add the following note:*

NOTE Higher leakage current values, not exceeding 3.5mA, may be allowed by applicable part 2 standards for Class 1 appliances employing radio interference filters.

16.3DV.1 D1 *Modification to replace footnote "a" of Table 7 with the following:*

[a]Appliances rated more than 250 V are tested at 2 U + 1000 V.

16.3DV.2 D1 *Modification to add footnote "c" to Table 7 and add superscript "c" after "Basic insulation":*

[c]For wet and moist applications, special test voltages could be considered in the applicable part 2.

20.2DV D1 *Modification to add the following after the fourth paragraph:*

The articulated probe of Figure 12DV shall be applied without appreciable force when the product is:

a) A hand-held product, or a hand-held part of a product, or

b) Accessible to children while the product is operating.

NOTE "Without appreciable force" is considered to be a force not exceeding 1 N.

21.1DV.1 D2 *Modification to add 21.1DV.1.1 – 21.1DV.1.3 after the end of the second paragraph:*

21.1DV.1.1 As an alternative to the spring hammer, the required impact may be applied by a solid, smooth, steel sphere 50 ± 1 mm in diameter, weighing approximately 0,53 kg.

21.1DV.1.2 For top surfaces, the steel sphere shall be allowed to fall freely from rest through the distance required to cause it to strike the enclosure when the sphere has the specified energy.

21.1DV.1.3 For surfaces other than the top, the steel sphere shall be suspended by a fine wire and allowed to fall as a pendulum through the distance required to cause it to strike the surface with the specified impact, and the enclosure shall be so placed that the surface to be tested is vertical and in the same vertical plane as the point of support of the pendulum.

21.1DV.2 D2 *Modification of the third paragraph:*

In the third paragraph, replace “0,5 J” with “2 J”.

22.2DV D2 *Modification to add the following:*

Disconnection of the neutral is not necessary for all single phase stationary appliances.

22.3DV DC *Modification to replace the 2nd and 3rd paragraph, and the note, with the following:*

A socket outlet-supported appliance shall meet the tipping moment requirements of Annex DVC.

22.11DV D2 *Modification to add 22.11DV.1 – 22.11DV.8:*

22.11DV.1 Adhesives shall not be used to secure NON-DETACHABLE PARTS to surfaces that have a temperature that exceeds 70°C during the test of Clause 11.

22.11DV.2 If NON-DETACHABLE PARTS are secured with adhesive to the inside of the ENCLOSURE or to other parts inside the ENCLOSURE, the adhesive shall have adequate bonding properties throughout the life of the equipment.

22.11DV.3 Compliance is checked by examination of the construction and test (see Annex DVA). In case of doubt, compliance is checked by the tests specified in 22.11DV.4 – 22.11DV.8.

22.11DV.4 A sample of the equipment or a part of the ENCLOSURE with the non-detachable part attached shall be evaluated with the sample placed with the barrier or screen on the underside.

22.11DV.5 Condition the sample in an oven at one of the following temperatures for the time durations specified:

a) 100°C± 2°C for one week; or

b) 90°C± 2°C for three weeks; or

c) 82°C± 2°C for eight weeks

22.11DV.6 Upon completion of the temperature conditioning:

a) Remove the sample from oven and leave it at any convenient temperature between 20°C and 30°C for 1 h,

b) Place the sample in a freezer at -40°C± 2°C for 4h,

c) Remove and allow the sample to come to any convenient temperature between 20°C and 30°C for 8 h,

d) Place the sample in a cabinet at 91% to 95% relative humidity for 72 h,

e) Remove the sample and leave it at any convenient temperature between 20°C and 30°C for 1 h,

f) Place the sample in an oven at the temperature used for the temperature conditioning for 4 h, and

g) Remove the sample and allow it to reach any convenient temperature between 20°C and 30°C for 8 hrs.

The sample shall then be immediately subjected to the force and torque tests of 22.11 and the impact test of Clause 21. The barrier or screen shall not fall off or partly dislodge as a result of these tests.

22.11DV.7 With the concurrence of the manufacturer, it is permitted to increase any of the above time durations specified in 22.11DV.5 or 22.11DV.6.

22.11DV.8 Additional testing may need to be conducted if the ENCLOSURE is exposed to oils and solvents during normal operation.

22.12DV D1 *Modification to add the following sentence to the note:*

Friction fits are not considered reliable with respect to protection against a hazard.

22.53DV D1 *Addition:*

General use socket outlets, if provided, should be considered in the applicable part 2 standards.

24DV DC *Modification to replace Clause 24 with the following:*

In this standard, component requirements are replaced by the relevant requirements of component standards listed in Annex DVA.

25.2DV D1 *Modification to add the following:*

Multiple supply mains connections may be permitted only as specified in part 2 standards.

25.3DV D2 *Modification to add Note 3:*

NOTE 3 Minimum supply lead length and size may be considered in applicable part 2 requirements.

25.8DV.1 DR *Modification to replace 25.8 with 25.8DV.1.1 – 25.8DV.1.2 (Canada and US Only):*

25.8DV.1.1 Ampacities of SUPPLY CORDS and attachment plugs shall not be less than the current rating of the appliance and shall be suitable for the application in accordance with national electrical installation requirements.

25.8DV.1.2 Compliance is checked by inspection.

25.8DV.2 D2 *Modification to replace 25.8 with 25.8DV.2.1 – 25.8DV.2.2 (Mexico Only):*

25.8DV.2.1 Conductors of supply cords shall have a nominal cross-sectional area not less than that shown in Table 11DV.

NOTE 1 The cross-sectional area of conductors shall not be less than 98% of the values specified in Table 11DV.

NOTE 2 For the measurement of the cross-sectional area of conductors the test method specified in the Mexican Standard NMX-J-066-ANCE is applicable.

25.8DV.2.2 Compliance is checked by measurement.

11DV *Modification to replace table 11 with 11DV (Mexico Only):*

Table 11DV – Minimum cross-sectional area of conductors

RATED CURRENT of appliance A				
Types C, E, EO, PD, S, SJ, SJO, SJOO, SO, SOO, SP-1, SP-2, SP-3, SRD, SV, SVO, and SVOO with thermoset ET, ETLB, ETP, ETT, SE, SEO, SJE, SJEO, SJT, SJTO, SJTOO, SP-1,SP-2, SP-3, SPT-1, SPT-2, SPT-3, ST, SRDE, SRDT, STO, STOO, SVE, SVEO, SVT, SVTO and STVOO with thermoplastic			Types AFS, AFSJ, HPD, HPN, HS, HSJ, HSJO,HSJOO, HSO and HSSOO	Nominal cross-sectional area mm^2
		≤0,2	–	Tinsel cord[a]
>0,2	and	≤3	–	0,5[a]
>3	and	≤6	–	0,75
>6	and	≤10	10	0,82 (0,75)[b]
>10	and	≤13	15	1,30 (1,0)[b]
13	and	≤16	17	1,5 (1,0)[b]
>16	and	≤25	30	2,5
>25	and	≤32	–	4
>32	and	≤40	–	6
>40	and	≤63	–	10

[a] These cords may only be used if their length does not exceed 2 m between the point where the cord or cord guard enters the appliance and the entry to the plug.

[b] Cords having the cross-sectional areas indicated in the parentheses may be used for portable appliances if their length does not exceed 2 m.

26.6DV.1 DR *Modification:*

Replace the wording ″shown in Table 13″ in the first paragraph by ″in accordance with the national electrical codes″.

26.6DV.2 DR *Deletion:*

Delete Table 13.

27.2ADV D1 *Addition:*

27.2ADV.1 If a fastener is intended to be used to secure a bonding conductor, it shall only be used for that purpose unless it is clear that it is unlikely to be removed or replaced during servicing.

27.2ADV.2 A single binding post may be used to secure both bonding conductors and the earthing conductor providing that the nut securing the earthing conductor is not relied on to secure the bonding conductors.

27.5DV.1 D1 *Modification to replace the 4th and 5th paragraph with 27.5DV.1.1 – 27.5DV.1.4 and Table 27.5DV:*

27.5DV.1.1 A current derived from a source having a no-load voltage not exceeding 12 V (a.c. or d.c.) and equal at least 2,0 times the rating of the earthed branch circuit, is passed between the earthing terminal or earthing contact and each of the ACCESSIBLE METAL PARTS in turn.

NOTE For the purpose of this requirement, the minimum rating of the branch circuit is 20 Amps

27.5DV.1.2 The voltage drop between the earthing terminal of the appliance or the earthing contact of the appliance inlet and the ACCESSIBLE METAL PART is measured and shall not exceed 4 volts.

27.5DV.1.3 The resistance of the PROTECTIVE EARTHING CONDUCTOR is not included in the measurement. However, if the PROTECTIVE EARTHING CONDUCTOR is supplied with the equipment, it may be included in the test circuit, but the measurement of the voltage drop is made only from the main protective earthing terminal to the part required to be earthed.

27.5DV.1.4 The resistance calculated from the current of this voltage drop shall not exceed 0,1 ohm. The test duration is specified in Table 27.5DV.

Table 27.5DV – Earthing resistance test duration

Over-current protection of branch circuit required for equipment (amps)	Time (min)
0–30	2
31–60	4
61–100	6
101–200	8
201 and over	10

27.5DV.2 D1 *Modification:*

Delete Note 1.

27.7DV D1 *Addition of 27.7DV.1 – 27.7DV.1.8:*

27.7DV.1 Size of Protective Conductors

27.7DV.1.1 PROTECTIVE EARTHING CONDUCTORS shall at least be of the same size as supply conductors and shall comply with the minimum conductor sizes of column A of Table 27.7DV.1.2.1.

27.7DV.1.2 Compliance is checked by inspection and measurement.

Table 27.7DV.1.2.1 – Minimum size of protective conductors

RATED CURRENT of the equipment under consideration	Minimum conductor sizes AWG(mm^2)	
Amperes	A	B
	PROTECTIVE EARTHING CONDUCTOR AWG (mm^2)	PROTECTIVE BONDING CONDUCTOR AWG (mm^2)
Up to and including 10	18 (0,82)	20 (0,52)
Over 10 up to and including 13	16 (1,31)	18 (0,82)
Over 13 up to and including 18	14 (2,08)	16 (1,31)
Over 18 up to and including 25	12 (3,.31)	14 (2,08)
Over 25 up to and including 30	10 (5,26)	12 (3,31)
Over 30 up to and including 40	8 (8,36)	10 (5,26)
Over 40 up to and including 55	6 (13,29)	8 (8,36)
Over 55 up to and including 70	4 (21,14)	6 (13,29)
Over 70 up to and including 95	2 (33,61)	4 (21,14)

27.7DV.1.3 PROTECTIVE BONDING CONDUCTORS shall comply with the following:

a) Shall pass the resistance test of 27.5, and

b) Shall be no smaller than the minimum conductor sizes in column B of Table 27.7DV.1.2.1; or for components only, be no smaller than the conductors that supply power to the component.

27.7DV.1.4 If the PROTECTIVE BONDING CONDUCTOR is smaller than the conductor supplying power to the component, or smaller than the conductor size in column B of Table 27.7DV.1.2.1, or a printed conductor on a printed circuit board, the protective bonding path shall demonstrate the ability to withstand a limited short circuit.

27.7DV.1.5 Compliance is determined by conducting the limited short circuit test specified in 27.7DV.1.6 and 27.7DV.1.7.

27.7DV.1.6 The protective earthing path is connected to the supply circuit having a capacity in accordance with Table 27.7DV.1.8.1. The capacity is determined without the protective earthing path in the circuit. The supply voltage is the nominal voltage of the a.c. mains supply. The specified over-current PROTECTIVE DEVICE rated no less than specified in 27.7DV.1.8 is connected in series with the protective earthing path.

27.7DV.1.7 During the test, the protective earthing path shall not open and there shall be no damage to any insulation, the failure of which would result in contact between the earth path and a LIVE PART. The integrity of the insulation is checked by the electric strength test of 16.1 by applying the test between LIVE PART and earthed parts.

27.7DV.1.8 The current rating of the overcurrent PROTECTIVE DEVICE shall be the smallest of the following:

a) The current rating of the attachment plug but not less than 20 A; or

b) The rating of an overcurrent PROTECTIVE DEVICE which is specified by the manufacturer for installation in the field to protect the equipment; or

c) The rating of an overcurrent PROTECTIVE DEVICE in the equipment that protects the circuit or part required to be earthed.

Table 27.7DV.1.8.1 – Short-circuit capacity for the limited short circuit test

Maximum rating of the appliance					
Volt-amperes single-phase	Volt-amperes 3-phase	Volt-amperes direct current	Horsepower (W)	Volts	Circuit capacity in amperes
0 – 1 176	0 – 832	0 – 648	0,5 max (373)	0 – 250	200
0 – 1 176	0 – 832	0 – 648	0,5 max (373)	251 – 600	1 000
1 177 – 1 920	833 – 1 496	649 – 1 140	>0,5 (373) to 1 (746)	0 – 600	1 000
1 921 – 4 080	1 497 – 3 990	1 141 – 3 000	>1 (746) to 3 (2 200)	0 – 250	2 000
4 081 – 9 600	3 991 – 9 145	3 001 – 6 960	>3 (2 200) to 7,5 (5 600)	0 – 250	3 500
9 601 or higher	9 146 or higher	6 961 or higher	>7,5 (5 600)	0 – 250	5 000
1 921 or higher	1 497 or higher	1 141 or higher	>1 (746)	251 – 600	5 000

28.2DV D1 *Modification:*

Delete the paragraph after the note and before the compliance statement.

28.5DV D1 *Addition of 28.5DV.1 – 28.5DV.4:*

28.5DV.1 Pillar, stud, or screw type protective earthing and protective bonding terminals shall comply with the minimum size requirements of Table 28.5DV.1.1.

Table 28.5DV.1.1- Sizes of terminals for PROTECTIVE EARTHING CONDUCTORS

Rated Current of Equipment	Minimum Nominal Thread Diameter mm	
A	Pillar Type or Stud	Screw Type
Up to and Including 10	3,0	3,5
Over 10 up to and including 16	3,5	4,0
Over 16 up to and including 25	4,0	5,0
Over 25 up to and including 32	4,0	5,0
Over 32 up to and including 40	5,0	5,0
Over 40 up to and including 63	6,0	6,0

28.5DV.2 Protective bonding terminals which do not comply with Table 28.5DV.1.1 are considered acceptable if they meet the requirements of 27.7DV.1.5.

28.5DV.3 The main protective earthing terminal for permanently connected equipment shall be provided with factory installed studs, screws, or bolts, together with the necessary hardware, if requiring a PROTECTIVE EARTHING CONDUCTOR larger than 10 AWG.

28.5DV.4 Compliance is checked by inspection and measurement.

29.1DV.1 D1 *Modification to add a 4th row to Table 15 with the following values:*

>300 and ≤480, – , 4 000, –

29.1DV.2 D1 *Modification to add the following footnote "d" to Table 16:*

[d] The clearances at terminals for the connection of field wiring are increased to 6,4 mm for rated impulse voltage of 1 500 V and 9,5 mm for rated impulse voltages of 2 500 and 4 000 V.

29.1DV.3 D1 *Modification to change the fourth line of Table 16 to the following:*

1 500, 1,2[c,d]

29.1DV.4 D1 *Modification to change the sixth line of Table 16 to the following:*

4 000, 3,5

29.2DV.1 D1 *Modification to add superscript "b" to title of Table 17 and add the following footnote:*

[b] The creepage distances at terminals for the connection of field wiring are increased to 9,5 mm for working voltages ≤250 volts, and 12,7 mm for voltages >250 and ≤ 600 volts.

30.1DV D2 *Modification to add the following:*

As an alternate, the minimum temperature for the ball pressure test for external parts may be 65 °C ± 2 °C if the part complies with the Mould Stress Relief Test of IEC 60695-10-3.

30.2DV D2 *Modification to add the following Note:*

NOTE 3 Additional flammability requirements for external enclosures of stationary appliances are specified in the part 2 standard when necessary.

30.2.1DV D2 *Modification to replace the second paragraph with the following:*

The glow-wire test is not carried out on parts of material classified at least HB40 according to IEC 60695-11-10 or having a glow-wire ignition temperature according to IEC 60695-2-13 of at least 575 °C, provided that the test sample was no thicker than the relevant part of the appliance.

30.2.2DV D2 *Modification to add the following to the end of 30.2.2:*

The glow-wire test is not carried out on parts of material classified at least V-1 according to IEC 60695-11-10, at least VTM-1 according to ISO 9773, or having a glow-wire ignition temperature according to IEC 60695-2-13 of at least

– 775 °C, for connections which carry a current exceeding 0,5 A during NORMAL OPERATION;

– 675 °C, for other connections,

provided that the test sample was no thicker than the relevant part of the appliance.

30.2.3.1DV D2 *Modification to replace first paragraph with the following:*

Parts of non-metallic material supporting connections that carry a current exceeding 0,2 A during NORMAL OPERATION, and parts of insulating material within a distance of 3 mm of such connections, are subjected to the glow-wire test of IEC 60695-2-11 with a test severity of 850 °C. However, the glow-wire test is not carried out on parts of material classified at least V-1 according to IEC 60695-11-10, or at least VTM-1 according to ISO 9773, or as having a glow-wire flammability index of at least 850 °C according to IEC 60695-2-12. If the glow-wire flammability index is not available for a sample with a thickness within ± 0,1 mm of the relevant part, then the test sample shall have a thickness equal to the nearest preferred value specified in IEC 60695-2-12 that is no thicker than the relevant part.

30.2.3.2DV.1 D2 *Modification to replace the second dashed item of the first paragraph with the following:*

– 675 °C, or shall be classified at least V-1 according to IEC 60695-11-10, or at least VTM-1 according to ISO 9773, for other connections,

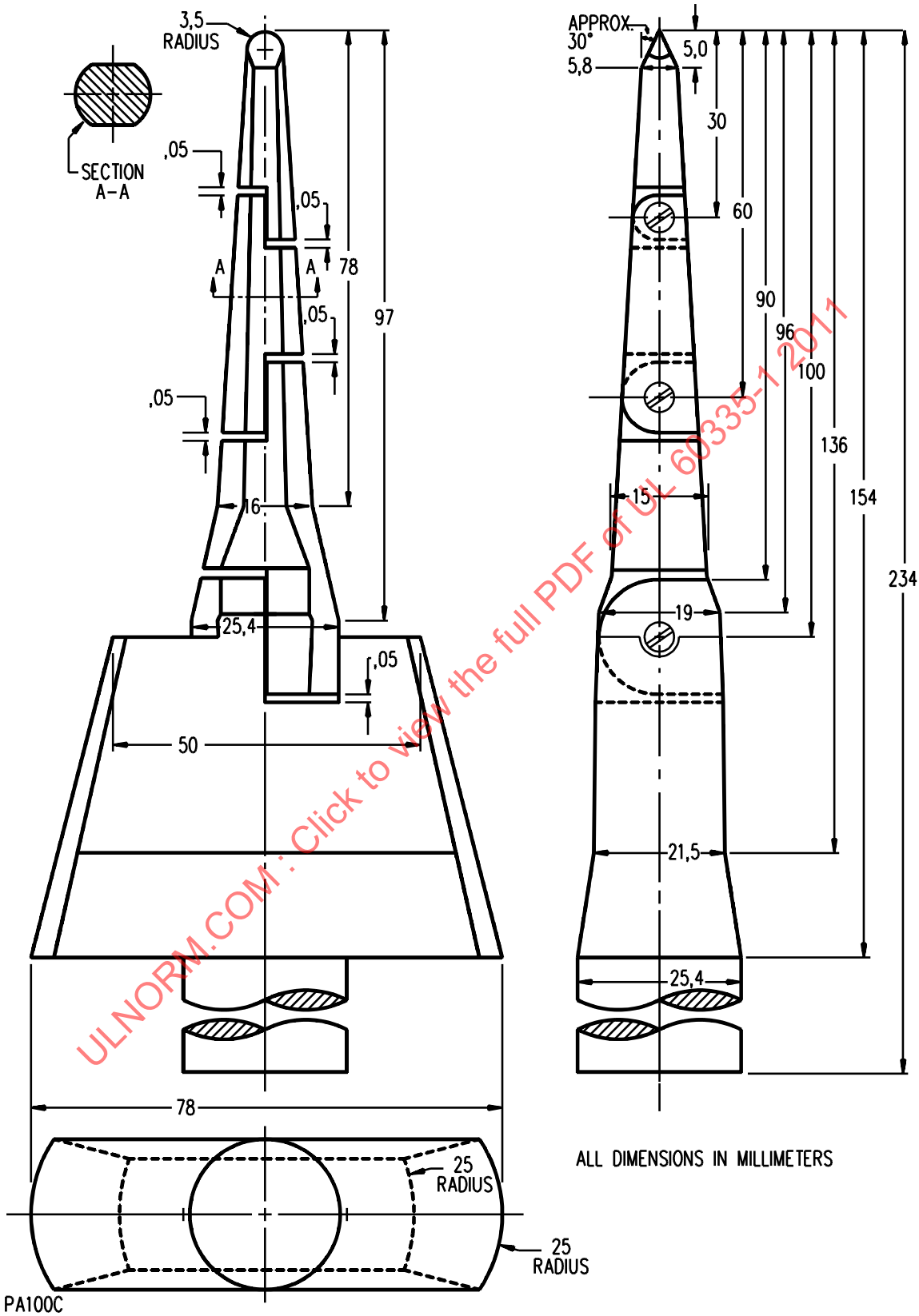
30.2.3.2DV.2 D2 *Modification to replace the last paragraph with the following:*

The needle-flame test is not carried out on parts of material classified as V-0 or V-1 according to IEC 60695-11-10 or at least VTM-1 according to ISO 9773, provided that the test sample used in the classification was no thicker than the relevant part of the appliance.

30.2.4DV D2 *Modification to replace the last dashed item with the following:*

– on a base material classified as V-0 according to IEC 60695-11-10, or VTM-0 according to ISO 9773, provided that the test sample used for the classification was no thicker than the printed circuit board.

Figure 12DV D1 *Addition:*



A.1DV D2 *Modification in Canada to replace A.1 with A.1DV.1 – A.1DV.1.3:*

A.1DV.1 Earth continuity test

A.1DV.1.1 To ensure reliability, every bond is tested for continuity in accordance with the following clauses, unless the design of a bond is such that it is unreasonable to suppose that it might lack continuity.

NOTE It is reasonable to suppose that a bond might lack continuity if either of the following conditions exists:

– if any essential part of the bond is not essential for the normal functioning of the equipment or is not an integral part of the equipment structure; or

– if any electrical connection between parts that is an essential part of the bond depends on a mechanical contact that is not also essential for a structural or functional purpose.

A.1DV.1.2 If it has been determined that a continuity test is required to ensure compliance with the provisions of A.1DV.1.1, the test is made:

– at such a point in the manufacturing process that subsequent operations are unlikely to disturb the bond being tested;

– using a procedure in accordance with A.1DV.1.3; and

– on all units produced or on a percentage of the units produced determined to be sufficient to provide an assurance of reliability.

A.1DV.1.3 The test equipment is not required to duplicate the procedure specified in 27.5, but should;

– apply to the bonds a potential of not more than 30 V open circuit; and

– require the passage of a current of at least 1 A through the bond in order to produce an indication of continuity.

DVA DC *Add a new annex DVA as follows:*

DVA.1 The following is a cross reference of component standards. The applicable requirements of the subject standards may apply as specified in 2DV.2 and 24DV.

DVA.2 For Mexico, IEC standards are considered informative. The Mexican version (NMX) is considered normative.

DVA.3 This listing is not intended to be complete.

Table DVA.3.1 – Component Standards Cross Reference

Clause	Code or Component	IEC/ISO	Standards Cross Reference		
			Canada	Mexico	US
19.11	Protective Electronic Circuit	N/A	C22.2 No. 0.8 – Safety Functions Incorporating Electronic Technology	N/A	UL 991 – Tests for Safety Related Controls Employing Solid State Devices
22.2	Edison-base Lampholders	IEC 60238 – Edison screw lampholders IEC 60400 – Lampholders for tubular fluorescent lamps and starterholders	C22.2 No. 43 – Lampholders	N/A	UL 496 – Lampholders
23.5	Wire and Cables	N/A	CAN/CSA-C22.2 No. 38 – Thermoset-Insulated Wires and Cables	N/A	UL 44 – Thermoset-Insulated Wires and Cables
			C22.2 No. 75 – Thermoplastic-Insulated Wires and Cables	NMX-J-010-ANCE – Thermoplastic-Insulated Wires and Cables	UL 83 – Thermoplastic-Insulated Wires and Cables
			CAN/CSA-C22.2 No. 198.1 – Extruded Insulated Tubing	N/A	UL 224 – Extruded Insulated Tubing
			CSA-C22.2 No. 210.2 – Appliance Wiring Material Products	N/A	UL 758 – Standard for Appliance Wiring Material
			CSA-C22.2 No. 127 – Equipment and Lead Wires	N/A	
			C22.2 No. 197 – PVC Insulating Tape	N/A	UL 510 – Polyvinyl Chloride, Polyethylene and Rubber Insulating Tape
24	Surge Suppressors	N/A	Certification Notice No.516 (Where the surge suppressor is relied upon to achieve Overvoltage Category 1, UL 1449 requirements apply)	N/A	UL 1449 – Surge Protective Devices
			C22.2 No. 1 – Audio, Video, and Similar Electronic Equipment		UL 224 – Extruded Insulated Tubing
			C22.2 No. 198.1 – Extruded Insulating Tubing		

Table DVA.3.1 – Component Standards Cross Reference Continued on Next Page

Table DVA.3.1 – Component Standards Cross Reference Continued

Clause	Code or Component	IEC/ISO	Standards Cross Reference		
			Canada	Mexico	US
24	Printed-Wiring Boards	IEC 61191 – Printed board assemblies	N/A	N/A	UL 796 – Printed Wiring Boards
					UL 746E – Polymeric Materials – Industrial Laminates, Filament Wound Tubing, Vulcanized Fibre, and Materials Used in Printed Wiring Boards
					UL746F – Polymeric Materials – Flexible Dielectric Film Materials For Use In Printed-Wiring Boards and Flexible Materials Interconnect Constructions
24	Tubing	N/A	CAN/CSA-C22.2 No. 198.1 – Extruded Insulating Tubing	N/A	UL 224 – Extruded Insulating Tubing
24	Switches	IEC 60730-2 Series – Automatic electrical Controls for household and similar use	C22.2 No. 111 – General-Use Snap Switches	J-NMX-005 (for switches)	UL 20 – General-Use Snap Switches
				J-NMX-508 (for clock operated switches rated up to 30 A, 250 Vac)	
				J-NMX-515 (for clock operated switches above 30A, 250 Vac)	
		N/A	N/A	N/A	UL 98 – Enclosed and Dead-Front Switches
		N/A	CAN/CSA-C22.2 No. 177 – Clock-Operated Switches	N/A	UL 917 – Clock-Operated Switches
		N/A	C22.2 No. 55 – Special Use Switches	N/A	UL 1054 – Special-Use Switches
		IEC 61058-1 – Switches for Appliances - Part 1: General Requirements	CAN/CSA-C22.2 No. 61058-1-05 – Switches for Appliances - Part 1: General Requirements	N/A	UL 61058-1 – Switches for Appliances – Part 1: General Requirements
		N/A	CAN/CSA-E730-2-7-94 – Automatic Electrical Controls for Household and Similar Use – Part 2: Particular Requirements for Timers and Time Switches	N/A	UL 60730-2-7 – Automatic Electrical Controls for Household and Similar Use; Part 2: Particular Requirements for Timers and Time Switches
24	Industrial Control Equipment	IEC 60204 – Safety of machinery – Electrical equipment of machines	CAN/CSA-C22.2 No. 14 – Industrial Control Equipment	N/A	UL 508 – Industrial Control Equipment

Table DVA.3.1 – Component Standards Cross Reference Continued on Next Page

Table DVA.3.1 – Component Standards Cross Reference Continued

Clause	Code or Component	IEC/ISO	Standards Cross Reference		
			Canada	Mexico	US
24	Circuit Breakers	N/A	CAN/CSA-C22.2 No. 5 – Molded Case Circuit Breakers, Molded-Case Switches, and Circuit-Breaker Enclosures	N/A	UL 489 – Molded-Case Circuit Breakers, Molded-Case Switches and Circuit-Breaker Enclosures
24	Enclosures for Electrical Equipment	IEC 60670 – Boxes and enclosures for electrical accessories for household and similar fixed electrical installations	CAN/CSA-C22.2 No. 94 – Special Purpose Enclosures	N/A	UL 50 – Enclosures for Electrical Equipment
		IEC 60529 – Degrees of protection provided by enclosures (IP code)			
24	Insulating Materials	IEC 60085 – Electrical insulation – Thermal classification	CAN/CSA-C22.2 No. 0 – General Requirements – Canadian Electrical Code, Part II	N/A	UL 1446 – Systems of Insulating Materials – General
		IEC 62114 – Electrical insulation systems - Thermal classification			UL746C – Polymeric Materials – Use in Electrical Equipment Evaluations
24	Marking and Labeling	N/A	C22.2 No. 0.15 – Adhesive Labels	N/A	UL 969 – Marking and Labeling Systems

Table DVA.3.1 – Component Standards Cross Reference Continued on Next Page

Table DVA.3.1 – Component Standards Cross Reference Continued

Clause	Code or Component	IEC/ISO	Standards Cross Reference		
			Canada	Mexico	US
24	Fuseholders	IEC 60127-6 – Miniature fuses – Part 6: Fuse-holders for miniature cartridge fuse-links	C22.2 No. 39 – Fuseholder Assemblies	N/A	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
					UL 4248-9 – Fuseholders – Part 9: Class K
					UL 4248-11 – Fuseholders – Part 11: Type C (Edison Base) and Type S Plug Fuse
					UL 4248-12 – Fuseholders – Part 12: Class R
					UL 4248-15 – Fuseholders – Part 15: Class T
24, 25	Direct Plug-in and External Power Supplies	N/A	CAN/CSA-C22.2 No. 223 – Power Supplies With Extra-Low-Voltage Class 2 Outputs (Mechanical Assembly Requirements Only)	N/A	UL 1310 – Class 2 Power Units
24, 25	Power Supplies	IEC 60335-2-29 – Particular requirements for battery chargers	CAN/CSA-E60335-2-29 – Household and Similar Electrical Appliances – Safety – Part 2-29: Particular requirements for battery chargers	N/A	

Table DVA.3.1 – Component Standards Cross Reference Continued on Next Page

Table DVA.3.1 – Component Standards Cross Reference Continued

Clause	Code or Component	IEC/ISO	Standards Cross Reference		
			Canada	Mexico	US
24	Fuses	IEC 60127-1 – Miniature Fuses – Part 1 Definitions for miniature fuses and general requirements for miniature fuse-links	CAN/CSA-C22.2 No. 248.1 – Low-Voltage Fuses – Part 1: General Requirements	NMX-J-009/248/1 – Low-Voltage Fuses – Part 1: General Requirements	UL 248-1 – Low-Voltage Fuses – Part 1: General Requirements
		N/A	CAN/CSA-C22.2 No. 248.2 – Low-Voltage Fuses – Part 2: Class C Fuses	NMX-J-009/248/2 – Low-Voltage Fuses – Part 2: Class C Fuses	UL 248-2 – Low-Voltage Fuses – Part 2: Class C Fuses
		N/A	CAN/CSA-C22.2 No. 248.3 – Low-Voltage Fuses – Part 3: Class CA and CB Fuses	NMX-J-009/248/3 – Low-Voltage Fuses – Part 3: Class CA and CB Fuses	UL 248-3 – Low-Voltage Fuses – Part 3: Class CA and CB Fuses
		N/A	CAN/CSA-C22.2 No. 248.4 – Low-Voltage Fuses – Part 4: Class CC Fuses	NMX-J-009/248/4 – Low-Voltage Fuses – Part 4: Class CC Fuses	UL 248-4 – Low-Voltage Fuses – Part 4: Class CC Fuses
		N/A	CAN/CSA-C22.2 No. 248.5 – Low-Voltage Fuses – Part 5: Class G Fuses	NMX-J-009/248/5 – Low-Voltage Fuses – Part 5: Class G Fuses	UL 248-5 – Low-Voltage Fuses – Part 5: Class G Fuses
		N/A	CAN/CSA-C22.2 No. 248.6 – Low-Voltage Fuses – Part 6: Class H Non-Renewable Fuses	NMX-J-009/248/6 – Low-Voltage Fuses – Part 6: Class H Non-Renewable Fuses	UL 248-6 – Low-Voltage Fuses – Part 6: Class H Non-Renewable Fuses
		N/A	CAN/CSA-C22.2 No. 248.7 – Low-Voltage Fuses – Part 7: Class H Renewable Fuses	NMX-J-009/248/7 – Low-Voltage Fuses – Part 7: Class H Renewable Fuses	UL 248-7 – Low-Voltage Fuses – Part 7: Class H Renewable Fuses
		N/A	CAN/CSA-C22.2 No. 248.8 – Low-Voltage Fuses – Part 8: Class J Fuses	NMX-J-009/248/8 – Low-Voltage Fuses – Part 8: Class J Fuses	UL 248-8 – Low-Voltage Fuses – Part 8: Class J Fuses
		N/A	CAN/CSA-C22.2 No. 248.9 – Low-Voltage Fuses – Part 9: Class K Fuses	NMX-J-009/248/9 – Low-Voltage Fuses – Part 9: Class K Fuses	UL 248-9 – Low-Voltage Fuses – Part 9: Class K Fuses
		N/A	CAN/CSA-C22.2 No. 248.10 – Low-Voltage Fuses – Part 10: Class L Fuses	NMX-J-009/248/10 – Low-Voltage Fuses – Part 10: Class L Fuses	UL 248-10 – Low-Voltage Fuses – Part 10: Class L Fuses

Table DVA.3.1 – Component Standards Cross Reference Continued on Next Page

Table DVA.3.1 – Component Standards Cross Reference Continued

Clause	Code or Component	IEC/ISO	Standards Cross Reference		
			Canada	Mexico	US
24	Fuses (continued)	N/A	CAN/CSA-C22.2 No. 248.11 – Low-Voltage Fuses – Part 11: Plug Fuses	NMX-J-009/248/11 – Low-Voltage Fuses – Part 11: Plug Fuses	UL 248-11 – Low-Voltage Fuses – Part 11: Plug Fuse
		N/A	CAN/CSA-C22.2 No. 248.12 – Low-Voltage Fuses – Part 12: Class R Fuses	NMX-J-009/248/12 – Low-Voltage Fuses – Part 12: Class R Fuses	UL 248-12 – Low-Voltage Fuses – Part 12: Class R Fuses
		N/A	CAN/CSA-C22.2 No. 248.13 – Low-Voltage Fuses – Part 13: Semiconductor Fuses	NMX-J-009/248/13 – Low-Voltage Fuses – Part 13: Semiconductor Fuses	UL 248-13 – Low-Voltage Fuses – Part 13: Semiconductor Fuses
		N/A	CAN/CSA-C22.2 No. 248.14 – Low-Voltage Fuses – Part 14: Supplemental Fuses	NMX-J-009/248/14 – Low-Voltage Fuses – Part 14: Supplemental Fuses	UL 248-14 – Low-Voltage Fuses – Part 14: Supplemental Fuses
		N/A	CAN/CSA-C22.2 No. 248.15 – Low-Voltage Fuses – Part 15: Class T Fuses	NMX-J-009/248/15 – Low-Voltage Fuses – Part 15: Class T Fuses	UL 248-15 – Low-Voltage Fuses – Part 15: Class T Fuses
		N/A	CAN/CSA-C22.2 No. 248.14 – Low-Voltage Fuses - Part 14: Supplemental Fuses	N/A	UL 1417 – Special Fuses for Radio- and Television- Type Appliances
24	Supplementary Protectors	N/A	C22.2 No. 235 – Supplementary Protectors	N/A	UL 1077 – Supplementary Protectors for Use in Electrical Equipment
24	Electric Actuators	60730-2-14 – Automatic Electrical Controls for Household and Similar Use – Part 2-14: Particular requirements for electric actuators	N/A	N/A	UL 60730-2-14 – Automatic Electrical Controls for Household and Similar Use; Part 2: Particular Requirements for Electric Actuators
24	Limit Controls	N/A	C22.2 No. 24 – Temperature-Indicating and Regulating Equipment	N/A	UL 353 – Limit Controls
24	Solid-State Controls	N/A	C22.2 No. 156 – Solid-State Speed Controls	N/A	UL 244A – Solid-State Controls for Appliances

Table DVA.3.1 – Component Standards Cross Reference Continued on Next Page

Table DVA.3.1 – Component Standards Cross Reference Continued

Clause	Code or Component	IEC/ISO	Standards Cross Reference		
			Canada	Mexico	US
24	Capacitors	IEC 60384-14 – Fixed Capacitors for Use in Electronic Equipment - Part 14: Sectional Specification: Fixed Capacitors for Electromagnetic Interference Suppression and Connection to the Supply Mains	N/A	N/A	UL 810 – Capacitors
		IEC 60384-14-1 – Fixed Capacitors for Use in Electronic Equipment - Part 14-1: Blank Detail Specification: Fixed Capacitors for Electromagnetic Interference Suppression and Connection to the Supply Mains - Assessment Level D			
		IEC 60384-14-2 – Fixed Capacitors for Use in Electronic Equipment Part 14-2: Blank Detail Specification-Fixed Capacitors for Electromagnetic Interference Suppression and Connection to the Supply Mains - Safety Tests Only			
		IEC 60384-14-3 – Fixed Capacitors for Use in Electronic Equipment- Part 14-3 Blank Detail Specification - Fixed Capacitors for Electromagnetic Interference Suppression and Connection to the Supply Mains - Assessment Level DZ			
24	Double Insulation	N/A	C22.2 No. 0.1-M1985 – General Requirements for Double-Insulated Equipment	N/A	UL 1097 – Double Insulation Systems for Use in Electrical Equipment

Table DVA.3.1 – Component Standards Cross Reference Continued on Next Page

Table DVA.3.1 – Component Standards Cross Reference Continued

Clause	Code or Component	IEC/ISO	Standards Cross Reference		
			Canada	Mexico	US
24	Attachment Plugs, Receptacles, Connectors, and Socket Outlets	IEC 60084 – Plugs and socket-outlets for household and similar purposes	C22.2 No. 42 – General Use Receptacles, Attachment Plugs, and Similar Wiring Devices	N/A	UL 498 – Attachment Plugs and Receptacles
		IEC 60309 – Plugs, socket-outlets and couplers for industrial purposes	C22.2 No. 182.1 – Plugs, Receptacles, and Connectors of the Pin and Sleeve Type		
		IEC 60320 – Appliance couplers for household and similar general purposes	C22.2 No. 182.2 – Industrial Locking Type, Special Use Attachment Plugs, Receptacles, and Connectors		
			C22.2 No. 182.3 – Special Use Attachment Plugs, Receptacles, and Connectors		
25.7	Cord Sets and Power Supply Cords	N/A	C22.2 No. 21 – Cord Sets and Power Supply Cords (“solid green” protective earthing conductor acceptable)	N/A	UL 817 – Cord Sets and Power-Supply Cords
25.7	Flexible Cords and Cable	N/A	C22.2 No. 49 – Flexible Cords and Cables	N/A	UL 62 – Flexible Cords and Cables
			C22.2 No. 96 – Portable Power Cables		
24	Quick Connect Terminals	IEC 60998 – Connecting devices for low-voltage circuits for household and similar purposes	C22.2 No. 153-M1981 – Quick Connect Terminals	N/A	UL 310 – Electrical Quick-Connect Terminals
24, 26	Wire Connectors (including connectors for field wiring)	N/A	C22.2 No. 65-03 – Wire Connectors	N/A	UL 486A-486B – Wire Connectors
			C22.2 No. 65-03 – Wire Connectors		
			N/A		UL 486C – Splicing Wire Connectors
			C22.2 No. 65-03 – Wire Connectors		UL 486E – Equipment Wiring Terminals for Use with Aluminum and/or Copper Conductors

Table DVA.3.1 – Component Standards Cross Reference Continued on Next Page

Table DVA.3.1 – Component Standards Cross Reference Continued

Clause	Code or Component	IEC/ISO	Standards Cross Reference		
			Canada	Mexico	US
24	Enclosure Materials	N/A	CAN/CSA-C22.2 No. 0.17 – Evaluation of Properties of Polymeric Materials	N/A	UL746C – Polymeric Materials – Use in Electrical Equipment Evaluations
					UL 723 – Test for Surface Burning of Building Materials
24	Thermal Cutoffs	IEC 60730-1 – Automatic electrical controls for household and similar use: Part 1 General requirements	C22.2 No. 209-M1985 – Thermal Cut-Offs	N/A	UL 60691 – Thermal Links – Requirements and Application Guide
		IEC 60730-2-3 – Automatic electrical controls for household and similar use: Part 2 Particular requirements for thermal protectors for ballasts for tubular fluorescent lamps			

Table DVA.3.1 – Component Standards Cross Reference Continued on Next Page

Table DVA.3.1 – Component Standards Cross Reference Continued

Clause	Code or Component	IEC/ISO	Standards Cross Reference		
			Canada	Mexico	US
24	Thermostats	N/A	C22.2 No. 24 – Temperature-Indicating and Regulating Equipment	N/A	UL 873 – Temperature-Indicating and Regulating Equipment
		IEC 60730-1 – Automatic Electrical Controls for Household and Similar Use – Part 1: General Requirements	CAN/CSA-E60730-1-02 – Automatic Electrical Controls for Household and Similar Use – Part 1: General Requirements		UL 60730-1A – Automatic Electrical Controls for Household and Similar Use – Part 1: General Requirements
		IEC 60730-2-4 – Automatic Electrical Controls for Household and Similar Use – Part 2: Particular Requirements for Thermal Motor Protectors for Motor-Compressors of Hermetic and Semi-Hermetic Type	CAN/CSA-E730-2-4-94 – Automatic Electrical Controls for Household and Similar Use – Part 2: Particular Requirements for Thermal Motor Protectors for Motor-Compressors of Hermetic and Semi-Hermetic Type		UL 60730-2-4 – Automatic Electrical Controls for Household and Similar Use – Part 2: Particular Requirements for Thermal Motor Protectors for Motor-Compressors of Hermetic and Semi-Hermetic Type
		IEC 60730-2-9 – Automatic Electrical Controls for Household and Similar Use – Part 2: Particular Requirements for Temperature Sensing Controls	CAN/CSA-E60730-2-9-01 – Automatic Electrical Controls for Household and Similar Use – Part 2: Particular Requirements for Temperature Sensing Controls		UL 60730-2-9 – Automatic Electrical Controls for Household and Similar Use – Part 2: Particular Requirements for Temperature Sensing Controls
24	Relays	IEC 60730-2-10 – Automatic electrical controls for household and similar use – Part 2-10: Particular requirements for motor-starting relays	CAN/CSA-C22.2 No. 14 – Industrial Control Equipment	N/A	UL 873 – Temperature-Indicating and Regulating Equipment
			C22.2 No 24 – Temperature Indicating and Regulating equipment		

Table DVA.3.1 – Component Standards Cross Reference Continued on Next Page

Table DVA.3.1 – Component Standards Cross Reference Continued

Clause	Code or Component	IEC/ISO	Standards Cross Reference		
			Canada	Mexico	US
24	Communication Circuits	N/A	CAN/CSA C22.2 No. 226-92 – Protectors in Telecommunication Networks	N/A	UL 497 – Protectors for Paired-Conductor Communication Circuits
			CAN/CSA C22.2 No. 226-92 – Protectors in Telecommunication Networks		UL 497A – Secondary Protectors for Communication Circuits
			CAN/CSA C22.2 No. 226-92 – Protectors in Telecommunication Networks		UL 497B – Protectors for Data Communication and Fire Alarm Circuits
			CAN/CSA C22.2 No. 233-M89 – Cords and Cord Sets for Communication Systems		UL 1863 – Communication Circuit Accessories
			CAN/CSA C22.2 No. 182.4-M90 – Plugs, Receptacles, and Connectors for Communication Systems		
24.1.7	Telecommun-ications Networks	IEC 62151 – Safety of Equipment Electrically Connected to a Telecommunication Network	CAN/CSA C22.2 No. 60950-1-07 – Information Technology Equipment Safety – Part 1: General Requirements	N/A	UL 60950-1 – Information Technology Equipment Safety – Part 1: General Requirements
24	Lithium Batteries	N/A	N/A	N/A	UL 1642 – Lithium Batteries
24	EMI Filters	N/A	C22.2 No. 8-M1986 – Electromagnetic Interference (EMI) Filters	N/A	UL 1283 – Electromagnetic Interference Filters
24	Motor Construction	N/A	C22.2 No. 100-04 – Motors and Generators	N/A	UL 1004 – Electric Motors
			C22.2 No. 113-M1984 – Fans and Ventilators		UL 507 – Electric Fans
24	Optical Isolators	N/A	Certification Notice, Component Acceptance Service No. 5A (Announcement of Extension of the Component Acceptance Service for Optocouplers and Related Devices)	N/A	UL 1577 – Optical Isolators

Table DVA.3.1 – Component Standards Cross Reference Continued on Next Page

Table DVA.3.1 – Component Standards Cross Reference Continued

Clause	Code or Component	IEC/ISO	Standards Cross Reference		
			Canada	Mexico	US
24	Transformers	IEC 61558-1 – Safety of power transformers, power supply units and similar Part 1 General requirements and tests	CAN/CSA-C22.2 No. 223-M91 – Power Supplies with Extra-Low Voltage Class 2 Outputs	N/A	UL 1310 – Class 2 Power Units
		IEC 61558-2-4 – Part 2: Particular requirements for isolating transformers for general use			
		IEC 61558-2-6 – Part 2: Particular requirements for safety isolating transformers for general use			
		N/A	CSA C22.2 No. 66.1 – Low Voltage Transformers – Part 1: General Requirements		UL 5085-1 – Low Voltage Transformers – Part 1: General Requirements
		N/A	CSA C22.2 No. 66.3 – Low Voltage Transformers – Part 3: Class 2 and Class 3 Transformers		UL 5085-3 – Low Voltage Transformers – Part 3: Class 2 and Class 3 Transformers
24	High-Voltage Components	N/A	C22.2 No. 1-04 – Audio, Video, and Similar Electronic Equipment	N/A	UL 1413 – High-Voltage Components for Television-Type Appliances
24	Double-Protection Capacitors	N/A	C22.2 No. 1-04 – Audio, Video, and Similar Electronic Equipment	N/A	UL 1414 – Capacitors and Suppressors for Radio- and Television-Type Appliances
24	Fusing Resistors	N/A	C22.2 No. 1-04 – Audio, Video and Similar Electronic Equipment	N/A	UL 1412 – Fusing Resistors and Temperature-Limited Resistors for Radio- and Television-Type Appliances
24	Outlet Boxes	N/A	CAN/CSA-C22.2 No. 18.1-04 – Metallic Outlet Boxes	NMX-J-023/1-ANCE – Metallic Outlet Boxes	UL 514A – Metallic Outlet Boxes
			CAN/CSA-C22.2 No. 18.3 – Conduit, Tubing, and Cable Fittings	NMX-J-017-ANCE – Conduit, Tubing, and Cable Fittings	UL 514B – Conduit, Tubing, and Cable Fittings
			CAN/CSA-C22.2 No. 85-M89 – Rigid PVC Boxes and Fittings	N/A	UL 514C – Nonmetallic Outlet Boxes, Flush-Device Boxes, and Covers

Table DVA.3.1 – Component Standards Cross Reference Continued on Next Page

Table DVA.3.1 – Component Standards Cross Reference Continued

Clause	Code or Component	IEC/ISO	Standards Cross Reference		
			Canada	Mexico	US
24	Terminal Blocks	N/A	C22.2 No. 158-1987 – Terminal Blocks	N/A	UL 1059 – Terminal Blocks
24	Adhesives and Coatings	N/A	N/A	N/A	UL 746C – Polymeric Materials – Use in Electrical Equipment Evaluations
24 and 30	Polymeric Materials	N/A	CAN/CSA-C22.2 No. 0.17 – Evaluation of Properties of Polymeric Materials	N/A	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 746D – Polymeric Materials – Fabricated Parts
24	Gasket and Seal Materials	N/A	N/A	N/A	UL 157 – Gaskets and Seals
24	Air Filter Units	N/A	N/A	N/A	UL 900 – Air Filter Units
24	Flammability of Plastic Materials 5VA, 5VB, V-0, V-1, V-2, HF-1, HF-2, HB-F, and HB	N/A	CAN/CSA-C22.2 No. 0.17 – Evaluation of Properties of Polymeric Materials	N/A	UL 94 – Tests for Flammability of Plastic Materials for Parts in Devices and Appliances
24	Motor Protection	N/A	C22.2 No. 77 – Motors with Inherent Overheating Protection	N/A	UL 2111 – Overheating Protection for Motors
			C22.2 No. 100 – Motors and Generators		
24	Flammability of Liquids	N/A	N/A	N/A	UL 340 – Test for Comparative Flammability of Liquids
24	Arc Fault Circuit Interrupters and Leakage Current Detection Interrupters	N/A	TIL M02A	N/A	UL1699 – Arc Fault Circuit Interrupters
Annex B	Ground-Fault Circuit Interrupters	N/A	CAN/CSA C22.2 No. 144-M91 – Ground Fault Circuit Interrupters	N/A	UL 943 – Ground-Fault Circuit Interrupters