



National Differences For

UL 60730-1

Automatic Electrical Controls for Household and Similar Use; Part 1: General Requirements

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UL 60730-1

Automatic Electrical Controls for Household and Similar Use; Part 1: General Requirements

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This new edition of UL 60730-1 is being issued to:

- 1) Adopt IEC's Amendments No. 1 and No. 2 of IEC 60730-1.***
- 2) Adopt UL's proposed changes to the national differences.***

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

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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 or figure. 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 or figure 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, or figure of the base IEC text.

National Differences

1.1.1DV DE Modification of 1.1.1 by adding the following after the first paragraph:

In IEC terminology, "safety" is defined as an acceptable level of risk. This is consistent with the intention of UL requirements to reduce the risk of fire, shock or injury to persons.

¹⁾ IEC 61810-1, Electromechanical elementary relays - Part 1: General and safety requirements.

1.2DV.1 DR Modification of 1.2 by adding the following text:

The maximum voltage is 600 V. The maximum current is unlimited.

1.5DV D2 Addition of the following to 1.5:

The following UL Standards are referenced in this Standard:

UL 20,
Switches, General Use Snap

UL 44,
Wires and Cables, Rubber-Insulated

UL 50,
Enclosures for Electrical Equipment

UL 50E,
Enclosures for Electrical Equipment, Environmental Considerations

UL 62,
Flexible Cord and Fixture Wire

UL 83,
Wire Cables, Thermoplastic-Insulated

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

UL 224,
Tubing, Extruded Quick-Connect

UL 228 series,
Low-Voltage Fuses

UL 310,
Terminals, Electrically Quick-Connect

UL 372,
Primary Safety Controls for Gas-and Oil-Fired Appliances

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UL 429,
Valves, Electrically-Operated

UL 467,
Grounding and Bonding Equipment

UL 486 series,
Wire Connectors

UL 498,
Attachment Plugs and Receptacles

UL 508,
Industrial Control Equipment, Electrical

UL 510,
Tape, Electrical Insulating

UL 512,
Fuseholders

UL 514A,
Metallic Outlet Boxes

UL 514B,
Fittings for Conduit and Outlet Boxes

UL 514C,
Nonmetallic Outlet Boxes, Flush-Device Boxes, and Covers

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

UL 796,
Printed-Wiring Boards

UL 810,
Capacitors

UL 817,
Cord Sets and Power-Supply Cords

UL 863,
Time-Indicating and -Recording Appliance

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Documents
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**UL 917,
*Switches, Clock Operated***

**UL 969,
*Marking and Labeling Systems***

**UL 1004,
*Motors, Electric***

**UL 1054,
*Switches, Special Use***

**UL 1059,
*Terminal Blocks***

**UL 1077,
*Protectors, Supplementary, for Use in Electrical Equipment***

**UL 1414,
*Capacitors, Across-the-Line, Antenna-Coupling and Line-by-Pass for Radio-and Television
-Type Appliances***

**UL 1434,
*Thermistor-type Devices***

**UL 1441,
*Sleeving, Coated***

**UL 1446,
*Systems of Insulating Materials – General***

**UL 1998,
*Software in Programmable Components***

**UL 2111,
*Overheating Protection for Motors***

**UL 5085-1
*Low Voltage Transformers – Part 1: General Requirements***

**UL 5085-2
*Low Voltage Transformers – Part 2: General Purpose Transformers***

**UL 5085-3
*Low Voltage Transformers – Part 3: Class 2 and Class 3 Transformers***

**UL 60691
*Thermal-Links – Requirements and Application Guide***

**UL 61058-1
*Switches for Appliances – Part 1: General Requirements***

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2.1.5DV D1 Modification of 2.1.5 by adding the following after the second note:

Replace IEC 61558-2-6 and IEC 61558-2-17 with UL 5085-1 and UL 5085-3.

2.1.6DV DR Addition of the following text:

A Class 2 transformer which is considered a safety isolating transformer is defined as a step-down transformer of the low-voltage secondary type (No-load voltage 30 volts or 42.4 V_{pk} or 60 Vdc or less) in accordance with Article 725 of the National Electrical Code, NFPA 70.

2.1.21DV DR Addition: Add the following paragraph to 2.1.21:

A PELV circuit supplied from a transformer where the supply system is less than 150 V to ground may be earthed for functional reasons, and are used in applications where SELV is not required. A PELV circuit that is supplied from a transformer where the supply system exceeds 150 V to ground, the PELV circuit shall be grounded.

2.4.5DV D2 Modification of 2.4.5 by adding the following text after the word "MICRO-DISCONNECTION":

"that is mechanically secured (see 11.4.16DV)."

2.7.3DV DR Modification of 2.7.3 by adding the following text after the notes:

CLASS 0I is not applicable.

2.7.8DV D2 Modification of 2.7.8:

Replace "Figure 2" with "Figure DVA.3.2.2."

2.7.15DV DR Modification: Replace the second from last sentence of 2.7.15 with the following:

Requirements for EQUIPOTENTIAL BONDING can be found in the National Electrical Code (NEC), NFPA 70 for the installation of buildings.

3DV DR Modification of 3 by adding the following after "the appropriate part 2":

In addition, controls shall be constructed so as to be installable in accordance with the National Electrical Code, NFPA 70.

4.2.1DV D2 Modification of 4.2.1:

Replace "23" with "27 (plus annexes)".

5.1DV DR Modification of 5.1 by adding the following text:

The maximum RATED VOLTAGE is 600 V in the USA.

5.2DV DR Modification of 5.2 by adding the following text:

The maximum current is unlimited in the USA.

6.2.3DV DE Modification of 6.2.3 by adding the following text to the end of the note:

“(carry only), make only or break only.”

6.2.5DV D2 Modification of 6.2.5 by adding the following text:

An INDEPENDENTLY mounted, in-line, or free standing control shall be rated in accordance with Annex DVB.

6.2.6DV D2 Modification of 6.2.6 by adding the following text:

An INDEPENDENTLY mounted, in-line, or free standing control shall be rated in accordance with Annex DVB.

6.4.3.13DV D1 Addition: Add the following to 6.4.3.13:

An action which is prevented from functioning automatically by a positive mechanical means (Type 1.AY or Type 2.AY)

6.5DV D2 Modification of 6.5 by adding the following text:

According to degrees of protection as indicated in the ENVIRONMENTAL protection enclosure requirements of UL 50 and UL 50E. Additional optional degrees of protection are permitted as shown in 6.5.1 and 6.5.2 or, for integrated or INCORPORATED CONTROLS, as otherwise declared.

6.13DV D2 Replace 6.13 with the following:

6.13DV.1 According to value of comparative tracking index (CTI) for the insulation material used

6.13DV.1.1 – material of material group IIIb with a CTI of 100 through 174 (CTI index 4);

6.13DV.1.2 – material of material group IIIa with a CTI of 175 through 249 (CTI index 3) or CTI of 250 through 399 (CTI index 2);

6.13DV.1.3 – material of material group II with a CTI of 400 through 599 (CTI index 1);

6.13DV.1.4 – material of material group I with a CTI of 600 or greater (CTI index 0).

7.2.1DV D2 Modification of 7.2.1:

Replace the references to Table 7.2 with Table 7.2DV.

7.2.9DV.1 D2 Modification of 7.2.9 by adding the following:

Alternating current (single phase).....



"or a.c."

7.2.9DV.2 D2 Modification of 7.2.9 by adding the following:

Direct current.....



"or d.c."

7.2.9DV.3 D2 Modification of 7.2.9 by adding the following:

Symbols for alternating current (single phase), alternating current (three phase), alternating current (three phase with neutral) and ambient temperature limits of SWITCH HEAD are not used in the USA.

7.2.9DV.4 D2 Modification of 7.2.9 by adding the following:

Letter type abbreviations (FLA for full load amperes, HP for horsepower) which clearly convey the assigned rating may be used.

7.2.9DV.5 D2 Modification of 7.2.9 by adding the following:

For independently-mounted, free standing and in-line controls, information regarding the connection of specific loads shall be on a wiring diagram or label attached to the control.

Table 7.2DV D2 Replacement of Table 7.2 with Table 7.2DV:**Table 7.2DV**

Information	Clause or subclause	Method
1 Manufacturer's name or trade mark ²⁾	7.2.6	C
2 UNIQUE TYPE REFERENCE ^{1) 2)}	2.11.1, 2.13.1, 7.2.6	C
3 RATED VOLTAGE OR RATED VOLTAGE RANGE in volts (V)	2.1.2, 4.3.2, 14.4	C
4 Nature of supply unless the control is for both a.c. and d.c., or unless the rating is the same for a.c. and d.c.	4.3.2, 6.1	C
4A Class 2 power source or circuit	DVC.2	C
5 Frequency if other than for range 50 Hz to 60 Hz inclusive	4.3.2	C
6 Purpose of control	2.2, 4.2.4, 4.3.5, 6.3, 17.16	D
6a Construction of control and whether the control is electronic	6.15, H.2.5.7, annex H	D
7 The type of load controlled by each circuit ⁷⁾	14, 17, 6.2, 23.1.1	C
15 Degree of protection provided by enclosure ⁸⁾	6.5.1, 6.5.2, 11.5	C
17 Which of the terminals are suitable for the connection of EXTERNAL CONDUCTORS, and if they are suitable for line or neutral conductors, or both	6.6, 7.4.2, 7.4.3, DVC.1.21	C
18 Which of the terminals for EXTERNAL CONDUCTORS are for a wider range of conductor sizes than those indicated in the table of 10.1.4.	10.1	D
19 For SCREWLESS TERMINALS the method of connection and disconnection ⁹⁾	10	D
20 Details of any special conductors which are intended to be connected to the terminals for INTERNAL CONDUCTORS	10.2.1	D
21 Maximum temperature of terminals for INTERNAL CONDUCTORS and terminals for external conductors of incorporated and integrated controls, if higher than 85 °C	14	X

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Information	Clause or subclause	Method
22 Temperature limits of the SWITCH HEAD, if T_{min} lower than 0 °C, or T_{MAX} if other than 25°C	6.7, 14.5, 14.7, 17.3	C
23 Temperature limits of mounting surfaces (T_s)	6.12.2, 14.1, 17.3	C
24 Classification of control according to protection against electric shock	6.8	X
25 For CLASS II CONTROLS, the symbol for Class II construction (See 7.3.1)	7.3	C
26 Number of cycles of ACTUATION (M) for each MANUAL ACTION	6.10, 17.10, 17.11	X
27 Number of automatic cycles (A) for each AUTOMATIC ACTION	6.11, 17.8, 17.9	X
28 Ageing period (Y) for controls with Type 1M or 2M action	6.16, 17.6	X
29 Type of disconnection or interruption provided by each circuit	2.4.1, 2.4.2, 2.4.3, 2.4.4, 6.9	X
30 PTI of materials used for insulation	6.13, table 20.3, note 2, Table 20.4, note 1, 21.2.7	X
31 Method of mounting control ⁵⁾	11.6	D
31a Method of providing earthing of control	7.4.3, 9, 9.1.1, 9.1.2	D
32 Method of attachment for NON-DETACHABLE CORDS ⁶⁾	10.1, 11.7	D
33 Intended transportation condition of control ²⁰⁾	16.1	X
34 Details of any limitation of OPERATING TIME ²¹⁾	14, 17	D
35 Period of electric stress across insulating parts	6.14	X
36 Limits of ACTIVATING QUANTITY for any SENSING ELEMENT over which MICRO-DISCONNECTION is secure (See also H.7.2, Item 36)	11.3.2	X
37 Minimum and/or maximum rates of change of ACTUATING QUANTITY, or minimum and/or maximum cycling rates for a SENSING CONTROL ⁴⁾	4.1.7, 15, 17	X
38 Values of overshoot of ACTIVATING QUANTITY for SENSING CONTROLS which are necessary for correct action, or which can be used for test purposes	17	X
39 TYPE 1 OR TYPE 2 ACTION	6.4	D
40 Additional features of TYPE 1 OR TYPE 2 ACTIONS	6.4.3, 11.4	D
41 MANUFACTURING DEVIATION and condition of test appropriate to deviation	2.11.1, 11.4.3, 15, 17.14	X
42 DRIFT	2.11.2, 11.4.3, 15, 16.2.4	X
43 Reset characteristics for cut-out action ³⁾	6.4	D
44 If a control is either to be hand-held or is intended for a hand-held equipment Whether a control is to be portable, stationary, or fixed	21	X
45 Any limitation to the number or distribution of FLAT PUSH-ON RECEPTACLES which can be fitted	10.2.4.4	D
46 OPERATING SEQUENCE for controls with more than one circuit, if significant	11.4.3	D
47 Extent of any SENSING ELEMENT	2.8.1	D
48 OPERATING VALUE (or values) or OPERATING TIME	2.3.11, 2.3.12, 6.4.3.10, 11, 14, 15.6, 17	D
49 Control POLLUTION degree	6.5.3	D
50 Control intended to be delivered exclusively to the EQUIPMENT MANUFACTURER	7.2.1, 7.2.6	X
51 Heat and fire resistance category The control shall be as indicated in annex D per clause 21	21	X
52 See annex H to 60		

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Information	Clause or subclause	Method
61 See annex J to 65		
66 See annex H to 74		
75 RATED IMPULSE VOLTAGE	2.1.12, 20.1	D
76 Type of printed circuit board coating	Annex P or Annex Q	X
77 Temperature for the ball pressure test	21.2.5	D
78 Maximum declared torque on single bush mounting using thermoplastic material	Table 19.1, note 1	D
79 Pollution degree in the micro-environment of the creepage or clearance if cleaner than that of the control, and how this is designed	Table H.27.1	X
80 Rated impulse voltage for the creepage or clearance if different from that of the control, and how this is ensured	Table H.27.1	X
81 The values designed for tolerances of distances for which the exclusion from fault mode "short" is claimed	Table H.27.1	D
82 See Annex J		
83 See Annex J		
84 See Annex J		
85 For Class III controls, the symbol for Class III construction	7.4.6	C
86 For SELV OR PELV circuits, the ELV limits realized	2.1.5, T.3.2	D
87 Value of accessible voltage of SELV/PELV circuit, if different from 8.1.1, product standard referred to for the application of the control, in which standard(s) the accessible SELV/PELV level(s) is (are) given	2.1.4, 6.8.4.1, 6.8.4.2, 8.1.1	D
88 See Annex U		

Items 8 to 14, inclusive, are VOID.

NOTES

1) The UNIQUE TYPE REFERENCE shall be such that, when it is quoted in full, the manufacturer of the control can supply a replacement which will be fully interchangeable with the original electrically, mechanically, dimensionally, and functionally.
It may comprise a series type reference with other marking, such as voltage rating or an ambient temperature marking, which together provide a UNIQUE TYPE REFERENCE.

2) VOID

3) The manufacturer may declare a time before which, or a specific value of ACTIVATING QUANTITY above which, manual reset shall not occur.

4) α_1 = minimum rising rate
 β_1 = minimum falling rate
The rate of change (α_1 and β_1) of the ACTIVATING QUANTITY are those applicable to NORMAL USE.
 α_1 = maximum rising rate (for TYPE 2 ACTIONS only)
 β_1 = maximum falling rate (for TYPE 2 ACTIONS only)
For test purposes, α_1 and β_1 shall be as declared but not lower than the limit(s) indicated in the appropriate Parts 2 for TYPE 1 ACTIONS and/or TYPE 2 ACTIONS. The values α_2 and β_2 are for test purposes only, and may alternatively be declared as a maximum cycling rate. The rates of change for the purpose of this standard shall be expressed in the units as shown in the following table*:

ACTIVATING QUANTITY	Unit for rate of change
Pressure	Pa/s
Temperature	K/h

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Information		Clause or subclause	Method
Position	mm/s		
Illumination	lux/s		
Velocity	mm/s ²		
Liquid level	mm/s		
Current	A/s		
Humidity	%/s		
Air flow	m ³ /s ²		

* When using other activating quantities, the units should be expressed as SI-units.

5) If, for INDEPENDENTLY MOUNTED CONTROLS, it is necessary to take special precautions when installing or using the control, these details shall be given in an instruction sheet accompanying the control.

Special precautions may be necessary, for example, for flush mounting INDEPENDENTLY MOUNTED CONTROLS. In order to ensure that, after building-in, the conditions necessary to meet the requirements of this standard are achieved, the instruction sheet for such controls shall include clear information concerning:

- the dimensions of the space to be provided for the control;
- the dimensions and position of the means for supporting and fixing the control within this space;
- a minimum CLEARANCE between the various parts of the control and the surrounding parts of the fitment;
- the minimum dimensions of ventilating openings and their correct arrangements;
- the connection of the control to the supply and the interconnection of separate components, if any.

If the supply conductors of a control can come into contact with parts of a terminal block or a compartment for FIXED WIRING, and these parts have, under conditions of NORMAL USE, a temperature exceeding that specified in table 14.1, the instruction sheet shall also state that the control shall be connected by means of conductors having the appropriate T rating. (see note 1 of table 14.1).

6) In-line cord, free-standing and INDEPENDENTLY MOUNTED CONTROLS, if fitted with NON-DETACHABLE CORDS using attachment methods Y or Z, shall have Documentation (D) containing the substance of one of the following statements, whichever is appropriate:

- “The supply cord of this control cannot be replaced; if the cord is damaged, the control should be discarded” (Z)

or

- “The supply cord of this control can be replaced only by the manufacturer or his accredited service agent” (Y).

This note does not apply in the USA. Attachment or replacement of NON-DETACHABLE CORDS is not considered a USER function.

7) For controls with more than one circuit, the current is applicable to each circuit and to each terminal. If these are different from each other, then it shall be made clear to which circuit or terminal the information applies. For circuits for resistive and inductive loads, the RATED CURRENT, or the rated load in VA, at power factors as indicated in the appropriate table of 17.2.

Motor load and PILOT DUTY load ratings are established as indicated in annex DVB and DVC respectively, and marked accordingly.

8) The marking (C) requirement does not apply to controls or parts thereof classified as IP00, IP10, IP20, IP30, and IP40. Control enclosures shall be marked in accordance with the environmental enclosure requirements of UL 50E.

A control enclosure which has been evaluated against the ingress of water only by the Rain Test shall be marked RAINTIGHT if so constructed that exposure to beating rain will not result in the entrance of water; RAINPROOF if so constructed, protected, or treated as to prevent beating rain from interfering with successful OPERATION of the control. Control enclosures are not required to be marked to indicate the degree of protection against the entrance of solid objects.

The IP system of marking may be optionally placed on an enclosure.

9) In Canada and the U.S.A., Marking (C) is required for the method of connection and disconnection of SCREWLESS TERMINALS for field wiring.

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Information	Clause or subclause	Method
A switch having one or more push-in (SCREWLESS) TERMINALS shall be marked:		
a) With instructions for connecting acceptably sized wire where readily visible during installation,		
b) With instructions for disconnecting a wire from the terminal where readily visible during wiring and rewiring,		
c) To specify use with "solid wire only" unless the terminal is intended for both solid and stranded wire, and		
d) With instruction to strip the insulation from conductors a specific length, where readily visible during installation.		
10) Void		
11) Void		
12) See annex H.		
to		
19)		
20) The method of packaging does not have to be declared.		
21) For in-line cord, free-standing and INDEPENDENTLY MOUNTED CONTROLS, this information shall be provided by method C.		

7.4.1DV D2 Addition: Add the following to 7.4.1:

Tests to determine the legibility and durability of markings placed on labels are in the Standard for Marking and Labeling Systems, UL 969. Markings, other than those placed on labels, are tested in accordance with Annex A.

7.4.6ADV D2 Addition: Add the following to 7.4.6:

See Annex DVC.

8.1.1DV DR Replacement of the third paragraph of 8.1.1 with the following text:

If SELV- OR PELV-circuits supplied at higher voltages are accessible, the current between the accessible part(s) and earth / referenced pole of the supply source of the SELV/PELV circuits shall comply with H.8.1.10.1.

8.1.3DV D2 Modification of 8.1.3 by adding the following text:

Sealing compounds are acceptable if investigated according to Annex D.

8.1.9.5DV D2 Modification of 8.1.9.5 by adding the following text:

The requirements of 8.1.9 to 8.1.9.5 inclusive are replaced by the requirements of Annex DVA.

8.3.2.4DV D2 Addition: Add the following to 8.3.2.4:

The voltage between the pins of the plug shall not exceed 30 V.

9.1.1DV.1 D2 Addition:

A splice shall not be employed in a wire used for bonding purposes.

9.1.1DV.2 D2 Addition of 9.1.1DV.2.1 and 9.1.1DV.2.2:

9.1.1DV.2.1 Individually covered or insulated grounding conductors shall have a continuous outer finish that is either green, or green with one or more yellow stripes and no other conductors visible to the INSTALLER in a field wiring compartment shall be so identified.

9.1.1DV.2.2 Additional requirements related to Grounding and Bonding of electrical installations and systems are specified in Article 250 of the National Electrical Code (NEC), NFPA 70.

9.1.2DV D2 Addition: Add the following to 9.1.2:

A grounding connection shall reliably penetrate a nonconductive coating, such as paint or vitreous enamel. Compliance is checked by the test of 9.3.1.

9.2DV D2 Modification of 9.2 by deleting the text under the compliance statement.**9.3.2DV D2 Modification of 9.3.2 by adding the following text after the notes:**

Earthing terminals for the connection of NON-DETACHABLE CORDS using methods X and M shall comply with the requirements of 10.2.

9.3.4DV D2 Modification of 9.3.4 by adding the following text:

A FLYING LEAD for connection to an external earthing conductor shall have a free length of 6 inch (152 mm) and shall have the free end insulated – for example, shall have the end folded back and taped to the lead – unless the lead is located so that it cannot contact LIVE PARTS in the event that the lead is not used in the field. It shall be not smaller than (1) the size specified in Table 9.3.4DV.1 (2) the conductor supplying the motor or component, whichever is smaller or (3) shall be tested to determine that it withstands overload and short-circuit conditions.

Table 9.3.4DV.1 D2 Addition:

Table 9.3.4DV.1

Rating or SETTING of automatic overcurrent device in circuit ahead of equipment, conduit, etc, Not exceeding amperes	Size of conductor ¹⁾			
	Copper wire AWG	Aluminum wire AWG	Rigid conduit or Pipe, Inch	Electrical metallic tubing, Inches
20 ²⁾	12	10	1/2	1/2
30	10	8	1/2	1/2
40	10	8	1/2	1/2
60	10	8	1/2	1/2
100	8	6	1/2	1/2
200	6	4	1/2	1
¹⁾ Or equivalent cross-sectional area. ²⁾ For a cord-connected device, the grounding wire in the cord may be the same size as the current-carrying conductors.				

9.3.6.1DV D2 Addition: Add 9.3.6.1DV.1 and 9.3.6.1DV.2:

9.3.6.1DV.1 An equipment-grounding terminal or lead grounding point shall be connected to the frame or enclosure by a positive means, such as by a bolted or screwed connection.

9.3.6.1DV.2 A grounding point shall be located so that it is unlikely that the grounding means will be removed during normal servicing.

10.1.1DV D2 Addition of 10.1.1DV.1 and 10.1.1DV.2:

10.1.1DV.1 Terminals for fixed wiring shall comply with the requirements contained in the Standard for Terminal Blocks, UL 1059. Methods X and M are not used in the USA. The attachment of a power supply cord may be made by the methods specified for external, internal, or INTEGRATED CONDUCTORS.

10.1.1DV.2 Flat quick connect terminals may be employed for limited power safety extra low voltage circuits (Class 2 National Electrical Code). Such connections shall:

- a) Have both engagement parts shipped with the control
- b) Have engagement parts provided with a means to permit interlocking
- c) Be accompanied by instructions for proper installation

10.1.4DV DR Modification of 10.1.4 by adding the following text:

With reference to Note 1, the nominal cross-sectional area of a conductor is related to the current being carried and shall be as stated in Article 310 and Article 400 of the National Electrical Code, NFPA 70.

10.1.4.2DV D2 Deletion:

Delete 10.1.4.2.

10.1.14DV.1 D2 Addition of 10.1.14DV.1.1:

10.1.14DV.1.1 A terminal plate tapped for a wire binding screw shall have two or more full threads which may be extruded to provide two full threads. Two full threads are not required if fewer threads make a connection which does not strip when the torque as stated in UL 486 is applied.

11.1DV D2 Modification of 11.1 by adding the following text:

Requirements for insulating materials and polymeric enclosures are contained in Annex D and/or the Standard for Polymeric Materials – Use in Electrical Equipment Evaluations, UL 746C.

11.1.3.1DV D2 Modification of 11.1.3.1 by adding the following text:

Individually covered or insulated grounding conductors shall have a continuous outer finish that is either green, or green with one or more yellow stripes.

11.1.3.2DV D2 Modification of 11.1.3.2 by adding the following text:

All individually covered or insulated conductors other than grounding conductors shall not use a continuous outer finish that is either green, or green with one or more yellow stripes.

11.2.3.3DV D2 Addition of 11.2.3.3DV.1 to 11.2.3.3DV.4:

11.2.3.3DV.1 A No. 18 AWG or 16 AWG (0,82 or 1,3 mm²) rubber-covered wire in other than a low-voltage circuit as described in 2.1.5 shall be at least Type RFH-1 with impregnated braid, for a potential of 300 V or less; and shall be at least Type RFH-2 with impregnated braid and shall be acceptable for the application for a potential of 301 – 600 V.

11.2.3.3DV.2 A No. 14 AWG (2,1 mm²) or larger conductor shall be Type TW, RH, or RHW wire.

11.2.3.3DV.3 Other types of conductors that have been found to be acceptable may also be employed; Type TF wire may be used wherever Type RFH-1 or RFH-2 wire is acceptable.

11.2.3.3DV.4 Tubing shall not be subjected to sharp bends, tension, compression, or repeated flexing, and shall not contact sharp edges, projections, or corners. Tubing may be used in dry or damp locations but is not acceptable in wet locations.

11.2.4DV D2 Modification of 11.2.4 by adding the following text:

The tests for insulating properties of a cord's sheath are contained in UL 62.

11.3.5DV D2 Modification of 11.3.5 by adding the following text after the note:

A component, such as a resistor, capacitor, diode, and the like, shall not be connected across the contacts of a safety control or a protective device.