

Subject 756

June 29, 2018

SUMMARY OF TOPICS

The following changes in requirements to the Standard for Coin and Currency Changers and Actuators, UL 756, are being proposed.

- 1. Proposed Revisions To Update Requirements For Controls***
- 2. Proposed Addition Of And Revisions To Requirements To Address Switch Mode Power Supply Units Increasingly Used In Coin And Currency Changers and Actuators***
- 3. Proposed Addition Of Requirements To Clarify Requirements Applicable To Accessories***
- 4. Proposed Additions Of Requirements To Clarify Requirements Applicable To Products Used In Protected Locations***
- 5. Proposed Revisions To Marking Requirements To Clarify Application Of UL 969 Requirements***
- 6. Proposed Revisions To EMI Filter Requirements To Specify An Alternate Compliance Option***
- 7. Proposed Revisions To Leakage Current Test Requirements To Allow Higher Leakage Current For Products That Require Electromagnetic Interference Suppression***
- 8. Proposed Revisions To Incorporate Editorial Corrections***

STP BALLOTS AND ALL COMMENTS DUE: August 13, 2018

UL's goal is to have no interest category comprise more than one-third of the STP membership balance. To improve the current balance for STP 751, UL is looking for participants in the (list categories needed) interest categories. Definitions for these interest categories are available on the Standards STP Internet site:

<http://ulstandards.ul.com/develop-standards/participation/interest-categories/>

If you are interested in applying for STP 751 membership or are aware of potential candidates for this STP, please contact the STP Project Manager, Elizabeth.Northcott@ul.com.

For your convenience in review, proposed additions to existing requirements are shown underlined and proposed deletions are shown ~~lined-out~~. When an entirely new section is being proposed for addition, the section is shown as a "NEW SECTION" but the individual clauses are not underlined.

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1. Proposed Revisions To Update Requirements For Controls

RATIONALE

Proposal submitted by: Barry Karnes, UL LLC

On June 23, 2015, UL 1054, Standard for Special Use-Switches was withdrawn and replaced with the UL 61058 series of standards (Standard for Safety for Switches for Appliances). In like manner, in October 2018, UL 353, Standard for Safety for Limit Controls, and UL 873, Standard for Safety for Temperature-Indicating and -Regulating Equipment, will be withdrawn and replaced by the UL 60730 series of standards (Standard for Safety for Automatic Electrical Controls for Household and Similar Use).

The proposals in this topic reflect the deletion of the option to use controls certified to UL 353, UL 873 and UL 1054. It also removes the references to UL 991, Standard for Safety for Tests for Safety-Related Controls Employing Solid-State Devices, and UL 1998, Standard for Safety for Software in Programmable Components, since UL 60730 and the UL 60335-1 based circuit requirements presently within UL 756 include the relevant requirements for electronic circuits and software.

In the proposed revisions to Table 23.1, the 3 V/m field strength value for radiated electromagnetic fields was chosen years ago because UL 60730-1, 3rd edition required this value and it was also the default value in UL 991. Over the years, enhanced technology used in communication circuits and for common household appliances (such as cellular telephones and wireless devices) have pushed the need for higher levels. Therefore, safety standards such as UL 60730-1 and UL 60335-1 have revised their requirements to consider different values based on a wider range of frequencies that are presently in use. Likewise, a proposal to update Paragraph 75.3.4 is being made for this same reason.

This proposals in this topic are intended to align the requirements in UL 756 with those in UL 60730-1 and UL 60335-1, accordingly.

Revisions to Table 23.1 are also being proposed to document the calibration requirements for motor protective electronic circuits.

A revision to 26.27 is being proposed to clarify the intent of these requirements.

The proposed revisions reflect present practice and do not change the intent of any requirements presently in UL 756.

NOTE: This topic is similar to and directly correlates with Topic No. 1 of the UL 541 bulletin dated June 29, 2018 and Topic No. 1 of the UL 751 bulletin dated June 29, 2018.

PROPOSAL

23.2.3 A protective electronic circuit providing motor protection in accordance with 23.2.2(a) shall comply with one of the following:

- a) ~~Item (a) deleted. Standard for Tests for Safety-Related Controls Employing Solid-State Devices, UL 991;~~
- b) Standard for Automatic Electrical Controls ~~for Household and Similar Use~~, = Part 1: General Requirements, UL 60730-1 and the specific applicable UL 60730 Part 2 Standard.
- c) Paragraph 26.31 and the Protective Electronic Circuits Tests, Section 75; or,

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d) Not create any risk of fire, electric shock or injury to persons under abnormal conditions with the protective electronic circuit rendered ineffective (open or short-circuited), e.g. use of a redundant circuit or control.

23.2.4 Software in a protective electronic circuit required as part of a motor protective device or system shall comply with one of the following:

a) ~~Item (a) deleted: The Standard for Software in Programmable Components, UL 1998 and be software Class 1;~~

b) The Standard for Automatic Electrical Controls for Household and Similar Use, = Part 1: General Requirements, UL 60730-1, as well as the specific applicable Part 2 and be software Class B;

c) Software Evaluation, Annex R in the Standard for Safety of Household and Similar Electrical Appliances, Part 1: General Requirements, UL 60335-1 and be software Class B; or

d) Not create any risk of fire, electric shock or injury to persons under abnormal conditions with the software rendered ineffective, e.g. use of independent redundant protective devices.

[Note from the STP Project Manager: Additional proposals for Table 23.1 are included under Topic 4.]

Table 23.1
Factors to be considered when evaluating protective electronic circuits

No.	Factor
1	Conducting failure-mode and effect analysis (FMEA) for the protective circuits and functions.
2	Electrical supervision of critical components resulting in the control becoming permanently inoperative and disconnecting power.
3	Temperature ranges as follows: Indoor Equipment: 32.0 ±3.6°F (0.0 ±2°C) and 104 ±3.6°F (40.0 ±2°C) Outdoor Equipment: -31.0 ±3.6°F (-35.0 ±2°C) and 104 ±3.6°F (40.0 ±2°C)
4	Cycling test duration: 14 days
5	Endurance test duration: 100,000 cycles
6	Radio-frequency electromagnetic field immunity: a) To conducted disturbances ^a – test level 3 b) To radiated electromagnetic fields – field strength of 3 V/m <u>Evaluate in accordance with 75.3.4 and 75.3.2.</u>
7	Humidity exposure: Indoor Equipment: 70 – 80°F (21.1 – 26.7°C) and minimum 50 percent relative humidity Outdoor Equipment: 70 – 80°F (21.1 – 26.7°C) and minimum 98 percent relative humidity
8	Electrical fast transient/burst immunity: Outdoor Equipment: test level 4 For all equipment other than outdoor use: test level 3
9	Surge immunity ^a : Outdoor Equipment: installation Class 4 For all equipment other than outdoor use: installation Class 3

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Table 23.1 Continued

No.	Factor
10	Electrostatic Discharge ^a with a Severity Level of 3 having: a) Contact discharge at 6 kV to accessible metal parts; and b) Air discharge at 8 kV to accessible parts of insulating material
11	<u>Voltage Dips and Interruptions: Evaluate in accordance with 75.3.8 and 75.3.2.</u>
12	<u>Harmonics and Interharmonics: Evaluate in accordance with 75.3.9 and 75.3.2.</u>
13	<u>Calibration (deviation and drift): Evaluate in accordance with 26.19 for a temperature protective control or 26.20 for a pressure protective control.</u>
^a The noted factors are exempt from being considered when requirements from the Standard for Tests for Safety-Related Controls Employing Solid-State Devices, UL 991, are applied.	

26.14 Except as specified in 26.17, a protective control shall comply with one of the following:

- a) ~~Item (a) deleted: Standard for Temperature-Indicating and Regulating Equipment, UL 873. The control shall comply with the endurance cycle requirements for safety controls in Table 46.1 of UL 873;~~
- b) ~~Standard for Automatic Electrical Controls for Household and Similar Use, – Part 1: General Requirements, UL 60730-1 and the Standard for Automatic Electrical Controls for Household and Similar Use, – Part 2-6: Particular Requirements for Automatic Electrical Pressure Sensing Controls Including Mechanical Requirements, UL 60730-2-6. The endurance cycle requirements in Table AA.1DV of UL 60730-2-6 for cut-outs shall be applied.~~
- c) ~~Standard for Automatic Electrical Controls for Household and Similar Use, – Part 1: General Requirements, UL 60730-1 and the Standard for Automatic Electrical Controls for Household and Similar Use, – Part 2-9: Particular Requirements for Temperature Sensing Controls, UL 60730-2-9. The endurance cycle requirements in Table CC.2 of UL 60730-2-9 for cut-outs shall be applied.~~
- d) ~~Item (d) deleted: Standard for Limit Controls, UL 353;~~
- e) Standard for Industrial Control Equipment, UL 508;
- f) ~~Item (f) deleted: Standard for Special-Use Switches, UL 1054;~~
- g) Standard for Switches for Appliances – Part 1 General Requirements, UL 61058-1, or
- h) Paragraph 26.31 and the Protective Electronic Circuits Tests, Section 75.

26.27 An operating control that complies with 26.21 shall also comply with the following:

- a) For electronic controls – Installation Class 2 for electromagnetic compatibility (EMC) shall be in accordance with the voltage surge testing in 75.3.6 and comply with the results specified in 75.3.2 Electromagnetic Compatibility (EMC) – Part 4-5: Testing and Measurement Techniques – Surge Immunity Test IEC 61000-4-5;
- b) Category II shall be the overvoltage category;

- c) Insulating materials shall have a minimum comparative tracking index (CTI) of 100 (Material Group III);
- d) The applicable pollution degree shall be as specified in 21.3 (a) – (d); and
- e) The endurance cycle requirements specified by either:
 - 1) Table CC.2 of the Standard for Automatic Electrical Controls ~~for Household and Similar Use~~; ~~Part 2-9: Particular Requirements for Temperature Sensing Controls~~, UL 60730-2-9, with the operating control (limiters) endurance cycle requirements being applied; or
 - 2) The Overload and Endurance Test – Switching Devices, Section 74.

75.3.4 Radiated fields shall be applied in accordance with the Standard for Electromagnetic compatibility (EMC) – Part 4-3: Testing and Measurement Techniques – Radiated, Radio-Frequency, Electromagnetic Field Immunity Test, , IEC 61000-4-3, ~~test level 3 being applicable~~. The frequency ranges tested shall be 80 MHz to 1000 MHz, ~~test level 3; and 1.4 GHz to 2.0 GHz, test level 3; and 2.0 GHz to 2.7 GHz, test level 2~~. The dwell time for each frequency shall be sufficient to observe a possible malfunction of the protective electronic circuit.

2. Proposed Addition Of And Revisions To Requirements To Address Switch Mode Power Supply Units Increasingly Used In Coin And Currency Changers and Actuators

RATIONALE

Proposal submitted by: Barry Karnes, UL LLC

Construction and performance requirements are being proposed to be revised and added to address switch mode power supply units. This technology is becoming more widely used instead of traditional transformers or linear power supply designs. The proposed requirements provide an additional option for evaluating switch mode power supply units, provided as part of coin and currency changers and actuators, to requirements in UL 756.

New proposed Paragraph 30.5.1 provides requirements for capacitors, such as those that may be part of switch mode power supply units.

Revisions to Section 41, Optical Isolators and Semiconductor Devices and Section 43, Power Supplies, are also being proposed to clarify the requirements whenever a switch mode power supply unit is used.

A proposal is being made to clarify the intent of Paragraph 30.2.

The proposed revisions reflect present practice and do not change the intent of any requirements presently in UL 756.

NOTE: This topic is similar to and directly correlates with Topic No. 3 of the UL 541 bulletin dated June 29, 2018 and Topic No. 4 of the UL 751 bulletin dated June 29, 2018.