

SUMMARY OF TOPICS

The following changes in requirements are being proposed:

- 1. For Preliminary Review Only: Revision of the Scope - Greater than 600 V Applications**
- 2. For Preliminary Review Only: Clarification of the Requirements for Spacings**
- 3. For Preliminary Review Only: Clarification of the Requirements for the Dielectric Voltage-Withstand Test**
- 4. For Preliminary Review Only: Clarification of the Requirements for the Sequence of Testing**
- 5. For Preliminary Review Only: Revision of the Requirements for Test Potential in the Dielectric Voltage-Withstand Test**
- 6. For Preliminary Review Only: Revision of the Scope - Applicability to Other Standards**
- 7. For Preliminary Review Only: Revision of the Requirements for Rubber Materials**
- 8. For Preliminary Review Only: Clarification of the Requirements for Polymeric Materials**
- 9. For Preliminary Review Only: Revision of Requirements for Class B Materials and the Addition of Requirements for Class A Materials**
- 10. For Preliminary Review Only: Editorial Revision of the Requirements for the Accelerated Aging Test**
- 11. For Preliminary Review Only: Clarification of the Requirements for the Temperature Test and for Markings**
- 12. For Preliminary Review Only: Revision of the Requirements for the Flammability Test and Ratings**
- 13. For Preliminary Review Only: Revision of the Marking Requirements for Devices for Disconnecting Use**
- 14. For Preliminary Review Only: Addition of the Grounding Impedance Test**
- 15. For Preliminary Review Only: Addition of the Ratings Section**
- 16. For Preliminary Review Only: Revision of the Scope to Address UL 498 as a Supplement to this Standard**

**FOR INTERNAL UL OR CSDS USE ONLY –
NOT FOR OUTSIDE DISTRIBUTION**



Documents
Document Sharing Hub

17. For Preliminary Review Only: Revision of the Requirements for Current-Carrying Parts

COMMENTS DUE: February 1, 2007

This proposal is for review and comment only (no ballot at this time). Please note that comments on a preliminary review document will not receive a response from the proposal author through CSDS. Instead, the proposal author is asked to review the comments received during the preliminary review and adjust the proposals and/or supporting rationale as the author determines to be appropriate. The preliminary review process is an informal mechanism that provides authors with the opportunity to refine their proposals before the proposals advance in UL's standards development process. Normally, the next step in the process is the more formal STP ballot and stakeholder review process. Only comments newly posted during the more formal STP ballot and stakeholder review process will be addressed and responded to.

For your convenience in review, proposed additions to existing requirements are shown underlined and proposed deletions are shown lined-out. Proposed new requirements are identified by (NEW).

1. For Preliminary Review Only: Revision of the Scope - Greater than 600 V Applications

RATIONALE

Proposal submitted by: Jacob Killinger, Underwriters Laboratories Inc.

Connectors have been evaluated for greater than 600 V applications based on applying the end product requirements such as Spacings and Dielectric Withstand tests. Such connectors are used in high voltage applications in monitors, arc-lamp fixtures, etc., which often utilize connectors in high voltage circuits up to 6 kV. These high voltage applications are often at startup or of a short duration.

Connectors evaluated for these specific end product high voltage applications have not been limited to the 600V maximum rating in 1.2. The spacing requirements and dielectric withstand test potential are based upon the requirements of the end product.

UL proposes a new Type 5 be established for connectors rated less than 31 A and from 601 V up to and including 6000 v ac or dc, or both.

UL also proposes to identify the last explanatory paragraph of 1.2 as a Note since it contains no requirements. UL proposes to add Type 5 into Tables 11.1 and 12.1 as well.

Revisions to paragraph 11.1 are being proposed in Topic 2, but while unchanged in this topic, paragraph 11.1 is included here for ease of review. Revisions to paragraph 17.3 are also being proposed in Topic 5. Revisions to Table 12.1 are also being proposed in Topics 3, 4, and 12.

PROPOSAL

1.2 These requirements apply to devices categorized as follows (See Figure 1.1):

- a) Type 0 rated less than 8.3 A and less than 30 V rms (42 V peak);
- b) Type 1A rated less than 8.3 A and from 30 V up to and including 600 V ac or dc, or both;
- c) Type 1B rated from 8.3 A up to and including 200 A, and less than 30 V rms (42 V peak);

**FOR INTERNAL UL OR CSDS USE ONLY –
NOT FOR OUTSIDE DISTRIBUTION**



Documents

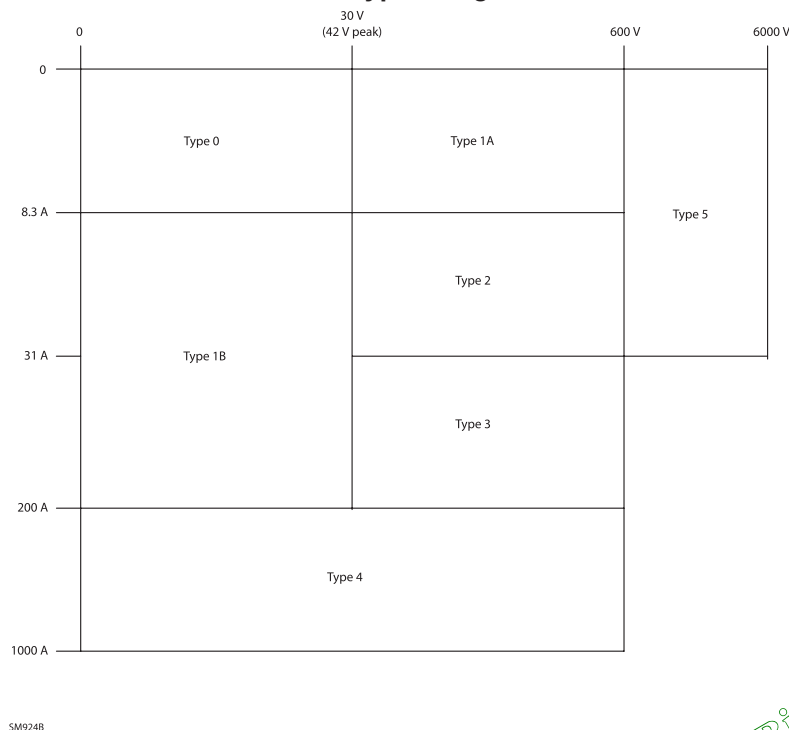
Document Sharing Hub

- d) Type 2 rated from 8.3 A to less than 31 A and from 30 V up to and including 600 V ac or dc or both;
- e) Type 3 rated from 31 A up to and including 200 A and from 30 V up to and including 600 V ac or dc, or both.
- f) Type 4 rated from greater than 200 A up to and including 1000 A, and up to and including 600 V ac or dc.
- g) Type 5 rated less than 31 A and from 601 V up to and including 6000 V ac or dc, or both.

Type designations used in this Standard only serve as a guide to determine appropriate requirements, and do not represent an assigned rating.

A device not without an assigned a current rating is considered either to be either a Type 0 or Type 1A depending upon the assigned voltage rating.

Figure 1.1
Connector type designations



(UNCHANGED)

11.1 For devices as specified in Table 11.1 there shall be a spacing through air or over surface of 1.2 mm (3/64 inch) or more for a device rated at 250 volts or less, and 3.2 mm (1/8 inch) or more for a device rated at more than 250 volts, between an uninsulated live part and:

- a) an uninsulated live part of opposite polarity,
- b) an uninsulated grounded metal part, or

FOR INTERNAL UL OR CSDS USE ONLY –
NOT FOR OUTSIDE DISTRIBUTION



Documents
Document Sharing Hub

- c) a non-current carrying metal part that is exposed to contact by persons when the device is installed and used in the intended manner.

Exception: Spacings less than those specified are permitted if the device complies with the requirements in the Dielectric Voltage-Withstand Test, Section 17.

Table 11.1
Applicability of spacing requirements

Type	Uninsulated live part – uninsulated live part of opposite polarity	Uninsulated live part – uninsulated grounded metal part	Uninsulated live part – exposed dead metal part
0	No	No	No
1A	Yes	Yes	Yes
1B	Yes	Yes	No
2	Yes	Yes	Yes
3	Yes	Yes	Yes
4	Yes	Yes	Yes
5	Yes	Yes	Yes

(NEW)

11.1.1 Spacings on a Type 5 device shall meet the minimum required values for the intended end-use application.

Table 12.1
Connector test programs

Test	Section	Connector Type						
		Type 0	Type 1A	Type 1B	Type 2	Type 3	Type 4	Type 5
Accelerated aging	13	O	O	O	O	O	O	O
Mold stress relief	14	X	X	X	X	X	X	X
Overload	15	–	O	O	O	O	N	N
Temperature	16	Y	Y	X	X	X	X	X
Dielectric voltage-withstand	17	–	O	O	O	O	O	X
Resistance to arcing	18	–	O	O	O	O	N	N
Conductor secureness	19	O	O	O	O	O	O	O
Flammability	19A	OA	OA	OA	OA	OA	OA	OA
X – Required Y – Required if device has an assigned current rating. O – Optional for some devices. Refer to test description for details. OA – Optional for all devices. N – Not permitted.								

FOR INTERNAL UL OR CSDS USE ONLY –
NOT FOR OUTSIDE DISTRIBUTION



Documents

Document Sharing Hub

17.3 The test potential ~~is to~~ shall be:

- a) 500 volts for a Type 1B device;
- b) 1000 volts plus twice rated voltage for Types 1A, 2, 3, and 4 devices.
- c) the minimum required values for the intended end-use application for a Type 5 device.

2. For Preliminary Review Only: Clarification of the Requirements for Spacings

RATIONALE

Proposal submitted by: Jacob Killinger, Underwriters Laboratories Inc.

Clause 11.1 incorrectly states an "or" between the required through air and over surface spacings. This literally can be interpreted to mean only one or the other of these is required. Spacings are traditionally measured for both the through air and over surface requirements. UL believes this "or" should be "and" and proposes this correction. To reflect present practice, UL further proposes to revise the requirements to clarify that the indicated spacings are minimum values.

Paragraph 11.1 is also shown in Topic 1, unchanged, for ease of review of proposed requirements in that topic.

PROPOSAL

11.1 For devices as specified in Table 11.1 there shall be a minimum spacing through air ~~or~~ and over surface of 1.2 mm (3/64 inch) ~~or more~~ for a device rated at 250 volts or less, and a minimum of 3.2 mm (1/8 inch) ~~or more~~ for a device rated at more than 250 volts, between an uninsulated live part and:

- a) an uninsulated live part of opposite polarity,
- b) an uninsulated grounded metal part, or
- c) a non-current carrying metal part that is exposed to contact by persons when the device is installed and used in the intended manner.

Exception: Spacings less than those specified are permitted if the device complies with the requirements in the Dielectric Voltage-Withstand Test, Section 17.

3. For Preliminary Review Only: Clarification of the Requirements for the Dielectric Voltage-Withstand Test

RATIONALE

Proposal submitted by: Jacob Killinger, Underwriters Laboratories Inc.

Clause 17.1 literally reads such that the Dielectric Voltage-Withstand Test is only performed when applying the reduced spacings exception to clause 11.1. This means that when the product does meet the spacings in clause 11.1, the Dielectric Voltage-Withstand Test is not performed. This is not correct. The practice has been that the Dielectric Voltage-Withstand Test is always performed following the

FOR INTERNAL UL OR CSDS USE ONLY –
NOT FOR OUTSIDE DISTRIBUTION



Documents

Document Sharing Hub

Temperature Test as stipulated in clause 17.2 regardless of whether it meets or does not meet the spacings in 11.1 or its exception. To correct this misconception, UL proposes revising Section 17 in its entirety as well as Table 12.1 to reflect present and correct practice.

Revisions to Table 12.1 are also being proposed in Topics 1, 4, and 12.

PROPOSAL

17 Dielectric Voltage-Withstand Test

(DELETED)

~~17.1 Devices to be evaluated in accordance with the Exception to 11.1 are to be subjected to the test described in 17.2 – 17.4.~~

~~Exception: Type 0 devices need not be tested.~~

17.2 Immediately following the temperature test, the same devices shall withstand, without arc-over or breakdown, for a period of 1 minute, the application of an essentially sinusoidal potential at a frequency in the range of 40 – 70 Hz. The test potential shall be applied between live parts of opposite polarity and between live parts and exposed non-current-carrying metal parts.

Exception: Type 0 devices need not be tested for the application of the exception for 11.1. All other types for reduced spacings in accordance with the exception to 11.1 are tested.

Table 12.1
Connector test programs

Test	Section	Connector Type					
		Type 0	Type 1A	Type 1B	Type 2	Type 3	Type 4
Accelerated aging	13	O	O	O	O	O	O
Mold stress relief	14	X	X	X	X	X	X
Overload	15	–	O	O	O	O	N
Temperature	16	Y	Y	X	X	X	X
Dielectric voltage-withstand	17	–	Θ X	Θ X	Θ X	Θ X	Θ X
Resistance to arcing	18	–	O	O	O	O	N
Conductor secureness	19	O	O	O	O	O	O
Flammability	19A	OA	OA	OA	OA	OA	OA
X – Required Y – Required if device has an assigned current rating. O – Optional for some devices. Refer to test description for details. OA – Optional for all devices. N – Not permitted.							

FOR INTERNAL UL OR CSDS USE ONLY –
NOT FOR OUTSIDE DISTRIBUTION



Documents

Document Sharing Hub

4. For Preliminary Review Only: Clarification of the Requirements for the Sequence of Testing

RATIONALE

Proposal submitted by: Jacob Killinger, Underwriters Laboratories Inc.

Sections 15 (Overload test), 16 (Temperature test), 17 (Dielectric Voltage-Withstand test) and 18 (Resistance to Arcing test) are ambiguous regarding the need to perform some or all of these tests in proper sequence on the same samples. The requirement for sequential testing can be found in clauses 18.1 and 18.2, but this can easily be overlooked. This can also be verified in Table B1 of CSA C22.2 No. 182.3.

UL proposes adding a footnote to Table 12.1 and revising Sections 16 and 18 to more clearly reflect this requirement. No revision to Section 17 is needed since the requirement is already contained in 17.2.

Revisions to Table 12.1 are also being proposed in Topics 1, 3, and 12.

PROPOSAL

Table 12.1
Connector test programs

Test	Section	Connector Type					
		Type 0	Type 1A	Type 1B	Type 2	Type 3	Type 4
Accelerated aging	13	O	O	O	O	O	O
Mold stress relief	14	X	X	X	X	X	X
Overload ^a	15	–	O	O	O	O	N
Temperature ^a	16	Y	Y	X	X	X	X
Dielectric voltage-withstand ^a	17	–	O	O	O	O	O
Resistance to arcing ^{a, b}	18	–	O	O	O	O	N
Conductor secureness	19	O	O	O	O	O	O
Flammability	19A	OA	OA	OA	OA	OA	OA
X – Required Y – Required if device has an assigned current rating. O – Optional for some devices. Refer to test description for details. OA – Optional for all devices. N – Not permitted. ^a For female devices intended for current interruption the overload, temperature, dielectric voltage-withstand and resistance to arcing tests shall be performed in sequence using the same test specimens. ^b The resistance to arcing test may be performed on a separate set of specimens. See 18.2.							

16.1.1 The temperature test shall be performed following the overload test, if applicable, on the same test specimens.

FOR INTERNAL UL OR CSDS USE ONLY –
NOT FOR OUTSIDE DISTRIBUTION



Documents

Document Sharing Hub