

5085-2

Low Voltage Transformers – Part 2: General Purpose Transformers

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UL Standard for Safety for Low Voltage Transformers – Part 2: General Purpose Transformers, UL 5085-2

First Edition, Dated April 17, 2006

Revisions: This Standard contains revisions through and including June 1, 2007.

Summary of Topics

This revision to ANSI/UL 5085-1 is being issued to revise the effective date information in the Preface to indicate that the standard is now in effect. CSA is not issuing a revision at this time. The change will be incorporated into the CSA version the next time UL and CSA modify the standard.

Text that has been changed in any manner is marked with a vertical line in the margin.

The revisions dated June 1, 2007 include a reprinted title page (page1) for this Standard.

The revisions dated June 1, 2007 were issued to revise the UL effective date information in the Preface.

As indicated on the title page (page 1), this UL Standard for Safety is an American National Standard. Attention is directed to the note on the title page of this Standard outlining the procedures to be followed to retain the approved text of this ANSI/UL Standard.

The UL Foreword is no longer located within the UL Standard. For information concerning the use and application of the requirements contained in this Standard, the current version of the UL Foreword is located on ULStandardsInfoNet at: <http://ulstandardsinfo.net/ulforeword.html>

The master for this Standard at UL's Northbrook Office is the official document insofar as it relates to a UL service and the compliance of a product with respect to the requirements for that product and service, or if there are questions regarding the accuracy of this Standard.

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The requirements in this Standard are now in effect, except for those paragraphs, sections, tables, figures, and/or other elements of the Standard having future effective dates as indicated in the preface. The prior text for requirements that have been revised and that have a future effective date are located after the Standard, and are preceded by a "SUPERSEDED REQUIREMENTS" notice.

New product submittals made prior to a specified future effective date will be judged under all of the requirements in this Standard including those requirements with a specified future effective date, unless the applicant specifically requests that the product be judged under the current requirements. However, if the applicant elects this option, it should be noted that compliance with all the requirements in this Standard will be required as a condition of continued Listing, Recognition and Follow-Up Services after the effective date, and understanding of this should be signified in writing.

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This Standard consists of pages dated as shown in the following checklist:

Page	Date
1-2	June 1, 2007
3-4	April 17, 2006
5-6	June 1, 2007
7-36	April 17, 2006

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First Edition



Underwriters Laboratories Inc.
UL 5085-2
First Edition

Low Voltage Transformers – Part 2: General Purpose Transformers

April 17, 2006

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Commitment for Amendments

This standard is issued jointly by the Canadian Standards Association (CSA) and Underwriters Laboratories Inc. (UL). Comments or proposals for revisions on any part of the standard may be submitted to CSA or UL at any time. Revisions to this standard will be made only after processing according to the standards development procedures of CSA and UL. CSA and UL will issue revisions to this standard by means of a new edition or revised or additional pages bearing their date of issue.

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Revisions of this Standard will be made by issuing revised or additional pages bearing their date of issue. A UL Standard is current only if it incorporates the most recently adopted revisions, all of which are itemized on the transmittal notice that accompanies the latest set of revised requirements. Comments or proposals for revisions on any part of the Standard may be submitted to UL at any time. Proposals should be submitted via a Proposal Request in UL's On-Line Collaborative Standards Development System (CSDS) at <http://csds.ul.com>.

The most recent designation of ANSI/UL 5085-2 as an American National Standard (ANSI) occurred on April 17, 2006. The ANSI approval for this standard does not include the Cover Page, Transmittal Pages, Title Page, or Preface.

This ANSI/UL Standard for Safety, which consists of the First edition including revisions through June 1, 2007, is under continuous maintenance, whereby each revision is ANSI approved upon publication.

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Preface

This is the common CSA and UL standard for low voltage transformers. It is the first edition of CSA C22.2 No. 66.2 and the first edition of UL 5085-2. This edition of CSA C22.2 No. 66.2 supersedes the requirements of CSA C22.2 No. 66 published in 1988. This edition of UL 5085-2 supersedes the Twelfth edition of UL 506 published in 2000.

This common standard was prepared by a Technical Harmonization Committee comprised of members from the Canadian Standards Association (CSA), Underwriters Laboratories Inc. (UL), and representatives of the low voltage transformer manufacturing industry. The efforts and support of members of the Technical Harmonization Committee are gratefully acknowledged.

This standard was reviewed by the CSA Subcommittee on C22.2 No. 66, under the jurisdiction of the CSA Technical Committee on Industrial Products and the CSA Strategic Steering Committee on Requirements for Electrical Safety, and has been formally approved by the CSA Technical Committee.

This Standard has been approved by the American National Standards Institute (ANSI) as an American National Standard.

Where reference is made to a specific number of samples to be tested, the specified number is to be considered a minimum quantity.

***Note:** Although the intended primary application of this standard is stated in its scope, it is important to note that it remains the responsibility of the users of the standard to judge its suitability for their particular purpose.*

Level of harmonization

This standard uses the IEC format but is not based on, nor is it to be considered equivalent to, an IEC standard. This standard is published as an equivalent standard for CSA and UL.

An equivalent standard is a standard that is substantially the same in technical content, except as follows: Technical national differences are allowed for codes and governmental regulations as well as those recognized as being in accordance with NAFTA Article 905, for example, because of fundamental climatic, geographical, technological, or infrastructural factors, scientific justification, or the level of protection that the country considers appropriate. Presentation is word for word except for editorial changes.

Reasons for Differences from IEC

The Technical Harmonization Committee identified the following IEC Standard within the scope of this standard: IEC 61558-1 (1998-07), Safety of power transformers, power supply units, and similar Part 1: General requirements.

The THC determined that the safe use of transformers and reactors is critically dependent on the electrical system in which they are intended to be installed. Significant investigation is required to assess safety and system compatibility issues that may lead to harmonization of traditional North American transformers and reactors with those presently addressed in the known IEC standards. The THC agreed such future investigation might be facilitated by completion of harmonization of North American standards for transformers and reactors.

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Interpretations

The interpretation by the standards development organization of an identical or equivalent standard is based on the literal text to determine compliance with the standard in accordance with the procedural rules of the standards development organization. If more than one literal interpretation has been identified, a revision is to be proposed as soon as possible to each of the standards development organizations to more accurately reflect the intent.

CSA Effective Date

The effective date for CSA International will be announced through CSA Informs or a CSA certification notice.

UL Effective Date

This Standard is now in effect.

Parts

The Standard for Low Voltage Transformers is divided into the following parts:

Part Number	Standard Title	Standard Number
1	General Requirements	CSA C22.2 No. 66.1/UL 5085-1
2	General Purpose Transformers	CSA C22.2 No. 66.2/UL 5085-2
3	Class 2 and Class 3 Transformers	CSA C22.2 No. 66.3/UL 5085-3
NOTES – 1. Part 1 covers the general requirements for transformer characteristics, marking, construction, and tests. Additional specific requirements are provided in the subsequent parts. 2. Part 2 and Part 3 supplement requirements and/or modify the corresponding clauses in Part 1 and should be applied together with Part 1. The numbered clauses in Part 2 and Part 3 correspond to the numbered clauses in Part 1.		

PART 2: GENERAL PURPOSE TRANSFORMERS

1 Scope

1.1 As noted in Low Voltage Transformers – Part 1: General Requirements, UL 5085-1, or CSA C22.2 No. 66.1, Low Voltage Transformers – Part 1: General Requirements, the requirements of Part 2 cover:

- a) Air-cooled transformers and reactors for general use;
- b) Autotransformers;
- c) Ferroresonant transformers;
- d) Cord-connected transformers; and
- e) Transformers incorporating overcurrent or over-temperature protective devices, transient voltage surge protectors, or capacitors.

1.7 These requirements do not cover Class 2 and Class 3 transformers (which are evaluated in Part 3).

1.8 Part 2 is intended to be used in conjunction with Part 1. The numbering of the clauses in Part 2 corresponds to the numbered clauses in Part 1. The requirements in Part 1 apply unless modified by Part 2.

5 Mechanical Assembly

5.4 A transformer weighing more than 45 kg (100 lbs) shall be provided with a means for lifting by a fork lift, cable, sling, or similar method. The lifting means may be provided on the transformer core or frame if the transformer has a removable top cover. The lifting means shall be subjected to the Lifting or Mounting Means Test in Clause 37.

Note: The lifting means test does not apply to a transformer that is intended to be lifted from underneath by a fork lift or other method.

6 Enclosure

6.5 Openings

6.5.2 Openings shall prevent passage of a straight rod 12.7 mm (0.5 in) in diameter. When the distance between live parts and the enclosure and between the plane of the ventilation opening and live parts is 102 mm (4 in) or more, openings shall be constructed so that they will prevent passage of a rod 19 mm (0.75 in) in diameter. When the distance between the plane of the opening and uninsulated live parts is less than 102 mm, the rod shall have a cross-section of 13.4 mm (0.53 in).

8 Connections

8.1 General

8.1.4 A transformer shall have provision for the connection of supply and load conductors, either in the form of busbars, leads, pressure terminal connectors, or terminal pads for pressure terminal connectors.

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