

# **Low Voltage Transformers — Part 3: Class 2 and Class 3 Transformers**



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The following revisions have been formally approved and are marked by a vertical line in the margin on the attached replacement pages:

<b>Revised</b>	Title page, copyright page, Contents, Preface, Clauses 1.3, 29.2, and 34.1, and Table 7
<b>New</b>	Clauses 11.6 and D1.4 and Figure D1.1
<b>Deleted</b>	None

- Update your copy by inserting these revised pages.
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First Edition

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ANSI/UL 5085-3-2012

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## Preface

This is the harmonized CSA Group and UL standard for low voltage transformers. It is the first edition of CSA C22.2 No. 66.3 and the first edition of UL 5085-3. This harmonized standard has been jointly revised on November 30, 2012. For this purpose, CSA Group and UL are issuing revision pages dated November 30, 2012.

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

This Standard is considered suitable for use for conformity assessment within the stated scope of the Standard.

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 Group 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 60558-1 (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.

## 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 Group Effective Date

The effective date for CSA Group will be announced through CSA Informs or a CSA Group 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 Transformer	CSA C22.2 No. 66.2/UL 5085-2
3	Class 2 and Class 3 Transformer	CSA C22.2 No. 66.3/UL 5085-3

### NOTES –

- Part 1 covers the general requirements for transformer characteristics, marking, construction, and tests. Additional specific requirements are provided in the subsequent parts.
- 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 3: CLASS 2 AND CLASS 3 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 in Part 3 cover Class 2 transformers for use with Class 2 circuits in accordance with the National Electrical Code, ANSI/NFPA 70, or the Canadian Electrical Code, Part I, CSA C22.1. They are intended for connection to essentially sinusoidal supply sources.

**Advisory Note:** For transformers intended for use in the United States, these requirements also cover Class 3 transformers for use with Class 3 circuits in accordance with the National Electrical Code, ANSI/NFPA 70, unless otherwise specified in this standard. See Annex D for Class 3 requirements.

1.3 In addition to the items specified in Clause 1.3 of Part 1, the requirements of Part 3 do not cover:

- a) Power supplies (a transformer provided with a rectifier is considered a power supply);
- b) Toy transformers;
- c) Cord and plug connected transformers other than Class 3;
- d) Direct plug-in transformers;
- e) Transformers intended for use in audio, radio, or television type appliances; or
- f) Other special types of transformers covered in requirements for other electrical devices or appliances.

**Advisory Note:** The requirements of Part 3 do not cover transformers intended for use in the United States having a nominal primary rating of more than 600 V and transformers having overvoltage taps rated over 660 V.

1.7 This part is intended to be used in conjunction with Part 1. The numbering of the clauses in Part 3 corresponds to the numbered clauses in Part 1. The requirements in Part 1 apply unless modified by Part 3.

1.8 A Class 2 transformer that includes a separate current-limiting impedance such as a resistor or a positive temperature coefficient device (PTC) is covered by these requirements.

1.9 A Class 2 transformer that includes a resonance regulating circuit is covered by these requirements.

### 4 Construction

4.2 A Class 2 transformer shall have only one secondary winding, which shall be insulated from the primary winding. A winding having intermediate taps is considered a single winding.

**Note 1:** Two or more secondary windings may be considered as a single winding and interposing insulation between the secondary windings is not required if the windings, when interconnected, are in compliance with the performance requirements for a single-winding construction.