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Residential Controls—Class 2 Transformers

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Foreword

This Standards Publication represents suggested standards for the construction and performance of Class 2 transformers designed primarily for use with residential controls. It has been developed in the public interest and is designed to promote a better understanding between the manufacturer and the user and to assist the user in selecting and obtaining the proper transformer for a particular application.

If a value for measurement as given in this Standards Publication is followed by an equivalent value in other units, the first stated value is to be regarded as the requirement. The given equivalent value might be only approximate.

This standard is periodically reviewed by the Residential Controls Section of NEMA for any revisions necessary to keep it up-to-date with evolving technology. Proposed or recommended revisions should be submitted to:

NEMA Technical Operations Department
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NOTE: The user's attention is called to the possibility that compliance with this Standard could require use of an invention covered by patent rights.

By publication of this Standard, no position is taken with respect to the validity of any such claim(s) or of any patent rights in connection therewith. If a patent holder has filed a statement of willingness to grant a license under these rights on reasonable and non-discriminatory terms and conditions to applicants desiring to obtain such a license, then details may be obtained from the Secretary.

This Standards Publication was developed by the Residential Controls Section. Section approval of the standard does not necessarily imply that all section members voted for its approval or participated in its development. At the time this standard was approved, the group was composed of the following members:

Apcom Inc.—Franklin, TN
Emerson Electric Company, White-Rodgers Division—St. Louis, MO
GE Industrial Systems—Morrison, IL
Honeywell, Inc.—Golden Valley, MN
Therm-O-Disc—Mansfield, OH

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History of Standards

In March 1958, the Residential Controls Section of NEMA adopted a standard regulation curve for Class 2 transformers. This standard was issued under the title "Voltage Ratings and Load Characteristics for Primary Control Equipment of 30 Volts and Less," and was a part of Publication No. DC 1, *General Standards for All Automatic Temperature Controls*.

At that time the transformer in general use by the industry was one having a 40-volt-ampere rating. It was, therefore, around this rating that the standard was developed. Subsequently, transformers having other ratings were introduced. These transformers, although they might have had the same electrical ratings, in many cases varied quite radically in performance. This presented problems from an interchangeability standpoint. Recognizing these problems, the Residential Controls Section in 1964 activated a program to write standards for all transformer sizes.

Publication No. ST 2-1973 was the result of the development and revision of several drafts developed by the Residential Controls Section of NEMA and approved by the Dry-Type and Specialty Transformer Section whose scope at that time included the products covered in this Standards Publication. It was reaffirmed and editorially revised in 1979. DC 20-1992 (R2003, R2009) revises and supersedes ST 2-1973 (R 1979).

This current revision of the standard has deleted all requirements which are contained in UL 5085-3, and references that document as appropriate. Other superfluous information has been deleted.

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Section 1 GENERAL

1.1 SCOPE

This Standards Publication covers Class 2 transformers intended primarily for use in 30 volts rms maximum low-voltage residential control circuits. It includes definitions, electrical ratings, performance standards, mounting dimensions, and marking requirements.

1.2 REFERENCES

The following publications are adopted, in whole or in part as indicated, by reference in this Standards Publication and are available from the organizations below.

National Fire Protection Association
Batterymarch Park
Quincy, Massachusetts 02269

American National Standards Institute
11 West 42nd Avenue
New York, NY 10036

ANSI/NFPA 70

National Electrical Code

Underwriters Laboratories, Inc.
333 Pfingsten Road
Northbrook, IL 60062

American National Standards Institute
11 West 42nd Avenue
New York, NY 10036

ANSI/UL 514 A
ANSI/UL 514 B
ANSI/UL 514 C
UL 5085-3

Metallic Outlet Boxes
Fittings for Cable and Conduit
Nonmetallic Outlet Boxes, Flush-Device Boxes and Covers
Standard for safety, Low Voltage Transformers – Part 3: Class 2 and Class 3 Transformers

1.3 DEFINITIONS

class 2 transformer: A Class 2 transformer is a step-down transformer of the low-secondary-voltage type, suitable for use in Class 2 remote-control low-energy circuits in accordance with ANSI/NFPA 70. It shall be of the energy-limiting type or of non-energy-limiting type equipped with over-current protection.

energy-limiting transformer: An energy-limiting transformer is a transformer that is intended for use on an approximately constant-voltage supply circuit and that has sufficient inherent impedance to limit the output current to a thermally safe maximum value.