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NEMA STANDARDS PUBLICATION NO. SG 5

Power Switchgear Assemblies

NEMA

NATIONAL ELECTRICAL MANUFACTURERS ASSOCIATION ■ 2101 L STREET, N.W., WASHINGTON, D.C. 20037

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NEMA SG 5-1990

SG 5

POWER SWITCHGEAR ASSEMBLIES

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Foreword

This is one of several NEMA Standards Publications covering the range of low- to high-voltage switchgear products. Such products are generally applied to utility and industrial use with a portion going to commercial applications. User and general interest input played a significant part in the development of the product requirements carried by this publication. It, as well as these other NEMA Standards Publications, is not intended to stand alone because without exception:

1. It adopts by reference the appropriate American National Standards (approved by American National Standards Committee C37) as the main body of this NEMA publication.
2. It offers a vehicle for getting into print the proposed NEMA revisions of the pertinent C37 Standards, until such time as those revisions can be evaluated, approved, and published as a revision of the particular American National Standard.
3. It covers additional information about a product of specific interest to the manufacturing community, which the American National Standards Committee does not include in its scope.

Within this NEMA Publication, therefore, the main focus is on American National Standards and the consensus method of standards approval used by ANSI.

Switchgear standards are, for the most part, developed through the combined and separate efforts of the Institute of Electrical and Electronics Engineers, the Association of Edison Illuminating Companies, and NEMA. American National Standards Committee C37 serves as the administrator through which are channeled all switchgear proposals intended for eventual publication as American National Standards. It is within these organizations that the principal manufacturer-user exchange is accomplished. This exposes product requirements to those people having the direct responsibility for the use, design, application, maintenance, and acceptance of the products and thus assures a most objective and critical review within the voluntary standards program.

This Standards Publication 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 low-voltage power circuit breaker for his particular need.

These standards are periodically reviewed by the Switchgear Section of NEMA for any revisions necessary to keep them up to date with advancing technology. Proposed or recommended revisions should be submitted to:

Vice President, Engineering Department
National Electrical Manufacturers Association
2101 L Street, N.W., Suite 300
Washington, D.C. 20037

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Scope

This standards publication covers:

1. Low Voltage Power Circuit Breakers rated 1000 volts ac or less:
   - Low-voltage ac power circuit breakers;
   - Low-voltage ac integrally fused power circuit breakers;
   - Low-voltage ac power circuit protectors;
   - Functional components for circuit breakers listed above for remote closing, remote opening, automatic opening, auxiliary contacts, attachments; etc., and,
   - Renewal and spare parts designed exclusively for use in the products enumerated above and not included in the scope of some other subdivision.
2. Low Voltage Power Circuit Breakers rated 3200 volts dc or less:
   - General purpose dc power circuit breakers;
   - General purpose dc power circuit breakers for mining applications;
   - Semi-high-speed dc circuit breakers;
   - High-speed dc circuit breakers;
   - Rectifier circuit breakers;
   - Field discharge circuit breakers;
   - Functional components for circuit breakers listed above for remote closing, remote opening, automatic opening, auxiliary contacts, attachments; etc., and,
   - Renewal and spare parts designed exclusively for use in the products enumerated above and not included in the scope of some other subdivison.
3. Low Voltage ac Secondary Network Protectors:
   - All low voltage ac secondary network protectors rated 600 volts ac or less, including all of the elements of the assembled network protector equipment as well as the enclosure; and,
   - Renewal and spare parts designed exclusively for use in the products enumerated above and not included in the scope of some other subdivision.

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SECTION 1
REFERENCED STANDARDS

1.1 REFERENCED STANDARDS

In this Publication, reference is made to the standards listed below. Copies are available from the indicated sources.

American National Standards Institute
1430 Broadway
New York, New York 10018

C37.13-198	*Low-voltage ac Power Circuit Breakers Used in Enclosures*
C37.14-1979 (R1986)	*Low-voltage dc Power Circuit Breakers Used in Enclosures*
C37.16-1988	*Preferred Ratings, Related Requirements and Application Recommendations for Low-Voltage Power Circuit Breakers and ac Power Circuit Protectors*
C37.17-1979 (R1988)	*Trip Devices for ac and General Purpose dc Low-voltage Power Circuit Breakers*
C37.18-1979 (R1986)	*Requirements for Field Discharge Circuit Breakers for Rotating Electric Machinery*
C37.27-1987	*Application Guide for Low-voltage ac Non-Integrally Fused Power Circuit Breakers*
C37.29-1981 (R1988)	*Low-voltage ac Power Circuit Protectors Used in Enclosures*
C37.50-1989	*Test Procedures for Low-voltage ac Power Circuit Breakers Used in Enclosures*
C37.52-1974 (R1989)	*Test Procedures for Low-voltage ac Power Circuit Protectors*
C37.100-1981 (R1989)	*Definitions for Power Switchgear*

SECTION 2
LOW-VOLTAGE AC POWER CIRCUIT BREAKERS USED IN ENCLOSURES

2.1 EXCEPTIONS TO AMERICAN NATIONAL STANDARD C37.13-1981

The following American National Standard has been approved as NEMA Standards and shall be inserted in this section: C37.13-1981.

NEMA Standard 9-5-1990.

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SECTION 3
LOW-VOLTAGE DC POWER CIRCUIT BREAKERS USED IN ENCLOSURES

3.1 EXCEPTIONS TO AMERICAN NATIONAL STANDARD C37.14-1979 (R1986)

The following American National Standard has been approved as NEMA Standards and shall be inserted in this section: C37.14-1979 (R1986).

NEMA Standard 9-5-1990

SECTION 4
PREFERRED RATINGS, RELATED REQUIREMENTS AND APPLICATION RECOMMENDATIONS FOR LOW-VOLTAGE POWER CIRCUIT BREAKERS AND AC POWER CIRCUIT PROTECTORS

4.1 EXCEPTIONS TO AMERICAN NATIONAL STANDARD C37.16-1988

The following American National Standard has been approved as NEMA Standards and shall be inserted in this section: C36.16-1988.

NEMA Standard 9-5-1990.

SECTION 5
TRIP DEVICES FOR AC AND GENERAL PURPOSE DC LOW-VOLTAGE POWER CIRCUIT BREAKERS

5.1 EXCEPTIONS TO AMERICAN NATIONAL STANDARD C37.17-1979 (R1988)

The following American National Standard has been approved as NEMA Standards and shall be inserted in this section: C37.17-1981 (R1988).

NEMA Standard 9-5-1990.

SECTION 6
ENCLOSED FIELD DISCHARGE CIRCUIT BREAKERS FOR ROTATING ELECTRIC MACHINERY

6.1 EXCEPTIONS TO AMERICAN NATIONAL STANDARD C37.18-1979 (R1986)

The following American National Standard has been approved as NEMA Standards and shall be inserted in this section: C37.18-1979 (R1986).

NEMA Standard 9-5-1990.

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SECTION 7
APPLICATION GUIDE FOR LOW-VOLTAGE AC NON-INTEGRALLY FUSED POWER CIRCUIT BREAKERS (USING SEPARATELY MOUNTED CURRENT LIMITING FUSES)

7.1 EXCEPTIONS TO AMERICAN NATIONAL STANDARD C37.27-1987

The following American National Standard has been approved as NEMA Standards and shall be inserted in this section: C37.27-1987.

NEMA Standard 9-5-1990.

SECTION 8
LOW-VOLTAGE AC POWER CIRCUIT PROTECTORS USED IN ENCLOSURES

8.1 EXCEPTIONS TO AMERICAN NATIONAL STANDARD C37.29-1981 (R1988)

The following American National Standard has been approved as NEMA Standards and shall be inserted in this section: C37.29-1981.

NEMA Standard 9-5-1990.

Section 9
TEST PROCEDURES FOR LOW-VOLTAGE AC POWER CIRCUIT BREAKERS USED IN ENCLOSURES

9.1 EXCEPTIONS TO AMERICAN NATIONAL STANDARD C37.50-1989

The following American National Standard has been approved as NEMA Standards and shall be inserted in this section: C37.50-1989.

NEMA Standard 9-5-1990.

SECTION 10
TEST PROCEDURES FOR LOW-VOLTAGE AC POWER CIRCUIT PROTECTORS

10.1 EXCEPTIONS TO AMERICAN NATIONAL STANDARD C37.52-1974 (R1989)

The following American National Standard has been approved as NEMA Standards and shall be inserted in this section: C37.52-1974 (R1989).

NEMA Standard 9-5-1990.

SECTION 11
DEFINITIONS FOR POWER SWITCHGEAR

11.1 EXCEPTIONS TO AMERICAN NATIONAL STANDARD C37.100-1981 (R1989)

The following American National Standard has been approved as NEMA Standards and shall be inserted in this section: C37.100-1981 (R1989).

NEMA Standard 9-5-1990.

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NEMA STANDARDIZATION

The purpose of NEMA Standards, their classification and status are set forth in certain clauses of the NEMA *Standardization Policies and Procedures* manual and are referenced below:

Purpose of Standards

National Electrical Manufacturers Association Standards are adopted in the public interest and are designed to eliminate misunderstandings between the manufacturer and the purchaser and to assist the purchaser in selecting and obtaining the proper product for their particular needs. Existence of a National Electrical Manufacturers Association Standard does not in any respect preclude any member or nonmember from manufacturing or selling products not conforming to the standard.

(Standardization Policies and Procedures, p. 1)

Definition of a Standard

A standard of the National Electrical Manufacturers Association defines a product, process or procedure with reference to one or more of the following: nomenclature, composition, construction, dimensions, tolerances, safety, operating characteristics, performance, rating, testing, and the service for which they are designed.

(Standardization Policies and Procedures, p. 2)

Dimensions

Where dimensions are given for interchangeability purposes, alternate dimensions satisfying the other provisions of the Standards Publication may be capable of otherwise equivalent performance.

(Standardization Policies and Procedures, p. 8)

Categories of Standards

National Electrical Manufacturers Association Standards are of three classes:

1. NEMA Standard, which relates to a product, process or procedure commercially standardized and subject to repetitive manufacture, which standard has been approved by at least 90 percent of the members of the Subdivision eligible to vote thereon;
2. Suggested Standard for Future Design, which may not have been regularly applied to a commercial product, but which suggests a sound engineering approach to future development, which standard has been approved by at least two-thirds of the members of the Subdivision eligible to vote thereon.
3. Adoptive Standard, which is adopted in whole or in part from the standards of another organization, either domestic, regional, or international.

(Standardization Policies and Procedures, pp 7 & 16)

Authorized Engineering Information

Authorized Engineering Information consists of explanatory data and other engineering information of an informative character not falling within the classification of NEMA Standard or Suggested Standard for Future Design, which standard has been approved by at least two-thirds of the members of the Subdivision eligible to vote on the standard.

(Standardization Policies and Procedures, pp. 7 & 16)

Official Standards Proposal

An Official Standards Proposal is an official draft of a proposed standard which is formally recommended to an outside organization(s) for consideration, comment and/or approval, and which has been approved by at least 90 percent of the members of the Subdivision eligible to vote thereon. *(Standardization Policies and Procedures, pp 7 & 16)*

Identification of Status

Standards in NEMA Standards Publications are identified in the foreword or following each standard as "NEMA Standard" or "Suggested Standard for Future Design." These indicate the status of the standard. These words are followed by a date which indicates when the standard was adopted in its present form by the Association.

The material identified as "Authorized Engineering Information" and "Official Standards Proposal" is designated similarly.

July 17, 1990

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POWER SWITCHGEAR ASSEMBLIES
LOW & MEDIUM VOLTAGE POWER CIRCUIT BREAKERS
MEDIUM VOLTAGE LOAD INTERRUPTER SWITCHES VOTING CLASSIFICATION
OF THE
NATIONAL ELECTRICAL MANUFACTURERS ASSOCIATION

MEMBER COMPANIES

ABB Power Distribution, Inc.
Sanford, FL 32771

ASC Industries, Inc.
North Canton, OH 44720-0523

Challenger Electrical
Equipment Corporation
Raleigh, NC 27609

Controlled Power Limited Partnership
Canton, OH 44710

Electrical Equipment
Birmingham, AL 35215

Electrical Power Systems, Inc.
Tulsa, OK 74131

GE
Burlington, IA 52601

Kearney
Division of Kearney-National, Inc.
Atlanta, GA 30359

Malton Equipment Company
Virginia, MN 55792

Pedersen Power Products
Division of E.A. Pedersen Company
Omaha, NE 68107

Power Controls, Inc.
Commerce, CA 90040

Power In Controls, Inc.
Placentia, CA 92670

The Pringle Electrical Manufacturing Company
Fort Washington, PA 19034

Republic Electric & Development
Peoria, IL 61615

Siemens Energy & Automation, Inc.
Switchgear Division
Raleigh, NC 27626

Square D Company
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Toshiba International Corporation
Industrial Division
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Pittsburgh, PA 15220

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