NEMA Standards Publication

ANSI/NEMA MG 1-2007 Condensed

Information Guide for General Purpose Industrial AC Small and Medium Squirrel-Cage Induction Motor Standards

National Electrical Manufacturers Association

National Electrical Manufacturers Association
1300 North 17th Street, Suite 900 • Rosslyn. VA 22209
www.NEMA.org

Condensed
NEMA MG 1

Information Guide for General Purpose Industrial AC Small and Medium Squirrel-Cage Induction Motor Standards

NEMA Standards Publication Condensed MG 1-2007

Information Guide for General Purpose Industrial AC Small
and
Medium Squirrel-Cage Induction Motor Standards

Published by

National Electrical Manufacturers Association
1300 North 17th Street, Suite 1752
Rosslyn, Virginia 22209

www.nema.org

NOTICE AND DISCLAIMER

The information in this publication was considered technically sound by the consensus of persons engaged in the development and approval of the document at the time it was developed. Consensus does not necessarily mean that there is unanimous agreement among every person participating in the development of this document.

The National Electrical Manufacturers Association (NEMA) standards and guideline publications, of which the document contained herein is one, are developed through a voluntary consensus standards development process. This process brings together volunteers and/or seeks out the views of persons who have an interest in the topic covered by this publication. While NEMA administers the process and establishes rules to promote fairness in the development of consensus, it does not write the document and it does not independently test, evaluate, or verify the accuracy or completeness of any information or the soundness of any judgments contained in its standards and guideline publications.

NEMA disclaims liability for any personal injury, property, or other damages of any nature whatsoever, whether special, indirect, consequential, or compensatory, directly or indirectly resulting from the publication, use of, application, or reliance on this document. NEMA disclaims and makes no guaranty or warranty, expressed or implied, as to the accuracy or completeness of any information published herein, and disclaims and makes no warranty that the information in this document will fulfill any of your particular purposes or needs. NEMA does not undertake to guarantee the performance of any individual manufacturer's or seller's products or services by virtue of this standard or guide.

In publishing and making this document available, NEMA is not undertaking to render professional or other services for or on behalf of any person or entity, nor is NEMA undertaking to perform any duty owed by any person or entity to someone else. Anyone using this document should rely on his or her own independent judgment or, as appropriate, seek the advice of a competent professional in determining the exercise of reasonable care in any given circumstances. Information and other standards on the topic covered by this publication may be available from other sources, which the user may wish to consult for additional views or information not covered by this publication.

NEMA has no power, nor does it undertake to police or enforce compliance with the contents of this document. NEMA does not certify, test, or inspect products, designs, or installations for safety or health purposes. Any certification or other statement of compliance with any health or safety–related information in this document shall not be attributable to NEMA and is solely the responsibility of the certifier or maker of the statement.

CONTENTS

Tables

Figures

Foreword

In the preparation of this Publication, input of users and other interested parties has been sought and evaluated. Inquiries, comments, and proposed or recommended revisions should be submitted to the concerned NEMA product Subdivision by contacting the:

Vice President, Engineering
National Electrical Manufacturers Association
1300 North 17th Street, Suite 1752
Rosslyn, VA 22209

This Publication was developed by the Motors and Generators Section. Section approval of the document does not necessarily imply that all section members voted for its approval or participated in its development. At the time it was approved, the Section was composed of the following members:

A.O. Smith Electrical Products Company—Tipp City, OH
Baldor Electric Company—Fort Smith, AR
Brook Crompton North America—Toronto, Canada
Cummins, Incorporated—Minneapolis, MN
Emerson Electric Company—St. Louis, MO
GE Industrial Systems—Fort Wayne, IN
Howell Electric Motors—Plainfield, NJ
Peerless-Winsmith, Incorporated—Warren, OH
RAM Industries—Leesport, PA
Regal-Beloit Corporation—Beloit, WI
- Leeson Electric—Grafton, WI
- Lincoln Electric—Cleveland, OH
- Marathon Electric—Wausau, WI

SEW-Eurodrive, Incorporated—Lyman, SC
Siemens Energy & Automation, Incorporated—Norwood, OH
Sterling Electric, Incorporated—Irvine, CA
TECO-Westinghouse Motor Company—Round Rock, TX
The Imperial Electric Company—Akron, OH
Toshiba International Corporation—Houston, TX
WEG Electric Motor Corporation—Suwanee, GA

<This page is intentionally left blank.>

1 PURPOSE

This is a condensation of the standards on motors included in NEMA Standards Publication *Motors and Generators*, MG 1-2006. Some standards are reprinted in their entirety while others have been combined or abbreviated. The numbers placed at the end of many of the paragraphs in this condensation (e.g. MG 1 Part 6) refer to the complete standard in MG 1.

2 SCOPE

The standards in this guide cover alternating-current squirrel-cage motors up to and including the ratings built in frames corresponding to the continuous open-type ratings given in Table 1.

3 DEFINITIONS

ambient temperature: The temperature of the surrounding air which comes into contact with the heated parts of the apparatus. [MG 1-1.56]

capacitor motor: A single-phase induction motor with main winding arranged for direct connection to power source and auxiliary winding connected in series with a capacitor. There are three types of capacitor motors: capacitor start, in which capacitor phase is in circuit only during starting; permanent-split capacitor which has the same capacitance for both starting and running; two-value capacitor motor in which there are different values of effective capacitance for starting and running. [MG 1-1.20.3.3]

current:

locked-rotor current: The steady-state current taken from the line, with the rotor locked and with rated voltage and rated frequency applied to the motor. [MG 1-1.53]

no-load current: The current flowing through a line terminal of a winding when rated voltage is applied at a rated frequency with no connected load. [MG 1-1.54]

design letters: Identifies specific performance requirements for starting and operating characteristics. See Table 8. [MG 1-1.19.1]

dimensions: Dimension are indicated by the NEMA letters given in Table 19. [MG 1-4.1]

dripproof motor: An open motor in which the ventilating openings are so constructed that successful operation is not interfered with when drops of liquid or solid particles strike or enter the enclosure at any angle from 0 to 15 degrees downward from the vertical. [MG 1-1.25.1]

dripproof guarded motor**:** A dripproof motor whose ventilating openings are guarded. [MG 1-1.25.5]

energy efficient polyphase squirrel-cage induction motor: An induction motor having an efficiency in accordance with 9.21.3. [MG 1-1.41.2]

frame number: The frame number for small motors is the "D" dimension in inches multiplied by 16. The frame number for medium motors consists of three or four digits. The first two digits are equal to four times the "D" dimension in inches. When this product is not a whole number, the first two digits of the frame number are the next higher whole number. The third and, when required, fourth digit of the frame number is obtained from the value of the "2F" dimension in inches as shown in the columns headed 1 to 15, inclusive, in the Table 13. [MG 1-4.2]

general-purpose motor: A squirrel-cage induction motor, rated 500 horsepower and less, open or enclosed construction. It is designed in standard ratings with standard operating characteristics and mechanical construction for use under usual service conditions without restriction to a particular application or type of application. [MG 1-1.6]

guarded motor: An open motor in which all openings giving direct access to live metal or rotating parts (except smooth rotating surfaces) are limited in size by the structural parts or by screens, baffles, grilles, expanded metal, or other means to prevent accidental contact with hazardous parts. Openings giving direct access to such live or rotating parts shall not permit the passage of a cylindrical rod 0.75 inch in diameter.