



General Specification for Consultants,
Industrial and Municipal:
NEMA Premium[®]
Efficiency Electric Motors

*General Specification for Consultants,
Industrial and Municipal:
NEMA Premium[®]
Efficiency Electric Motors*

Published by:

National Electrical Manufacturers Association
1300 North 17th Street, Suite 900
Rosslyn, Virginia 22209

www.nema.org

© 2014 National Electrical Manufacturers Association. All rights, including translation into other languages, reserved under the Universal Copyright Convention, the Berne Convention for the Protection of Literary and Artistic Works, and the International and Pan American copyright conventions.

NOTICE AND DISCLAIMER

The information in this publication was considered technically sound by a consensus among persons engaged in its development at the time it was approved. Consensus does not necessarily mean there was unanimous agreement among every person participating in the development process.

The National Electrical Manufacturers Association (NEMA) standards and guideline publications, of which the document herein is one, are developed through a voluntary 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. Although NEMA administers the process and establishes rules to promote fairness in the development of consensus, it does not write the documents, nor does it 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, 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, express 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 particular purpose(s) or need(s). 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 circumstance. 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.

TABLE OF CONTENTS

	Page
Foreword.....	iv
1 GENERAL.....	1
2 DESIGN STANDARDS.....	1
3 SERVICE CONDITIONS.....	1
3.1 Usual Service Conditions.....	1
4 ENCLOSURES.....	1
5 ELECTRICAL DESIGN.....	1
6 MECHANICAL DESIGN.....	2
6.1 Bearings.....	2
6.2 Lubrication.....	2
6.3 Other.....	2
6.4 Accessories (When Specified).....	2
7 SUBMITTAL DATA REQUIRED.....	2
8 TESTS (IN ADDITION TO MANUFACTURERS' STANDARD TESTS).....	2
 ANNEXES	
Annex A	NEMA MG 1-2014 Table 12-12, Full-Load Efficiencies for 60 Hz Premium Efficiency Medium Electric Motors Rated 600 Volts or Less (Random Wound)3
Annex B	NEMA MG 1-2014 Table 12-13, Full-Load Efficiencies for 60 Hz Premium Efficiency Medium Electric Motors Rated 5000 Volts or Less (Form Wound).....5
Annex C	NEMA MG1-2014 Table 20-B Full-Load Efficiencies For 60 Hz Premium Efficiency Large Electric Motors Rated 600 Volts Or Less (Random Wound)6
Annex D	NEMA MG1-2014 Table 20-C Full-Load Efficiencies For 60 Hz Premium Efficiency Large Electric Motors Rated 5000 Volts Or Less (Form Wound)7

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 following:

Senior Technical Director, Operations
National Electrical Manufacturers Association
1300 North 17th Street, Suite 900
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:

Baldor Electric Company—Fort Smith, AR
Brook Crompton North America—Toronto, Canada
Cummins, Incorporated—Minneapolis, MN
Nidec Motor Corporation St. Louis, MO
GE Industrial Systems—Fort Wayne, IN
Howell Electric Motors—Plainfield, NJ
Peerless-Winsmith, Incorporated—Warren, OH
Regal-Beloit Corporation—Beloit, WI

SEW-Eurodrive, Incorporated—Lyman, SC
Siemens Industry 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 Corp—Duluth, GA

1 GENERAL

The intent of this specification is to outline the minimum requirements for three-phase ac induction motors applied to municipal and industrial applications for operation on voltages 5000 volts or less, rated 2500HP or less, operating more than 2000 hours per year at >75% of full-load.

2 DESIGN STANDARDS

In addition to this specification, equipment shall comply with the current applicable standards promulgated by the following organizations:

AFBMA Anti-Friction Bearing Manufacturers Association

ANSI American National Standards Institute

ASTM American Society of Testing Materials

AWWA American Water Works Association

IEEE Institute of Electrical and Electronics Engineers (Testing)

HI Hydraulic Institute

NEMA National Electrical Manufacturers Association

NEMA MG 1

3 SERVICE CONDITIONS

3.1 Usual Service Conditions

- a) Ambient temperature not greater than 40°C and not less than -15°C.
- b) Voltage variation within +/- 10%.
- c) Frequency variation within +/- 5%.
- d) Combination of b) and c) above, not to exceed 10%.
- e) Exposure to an altitude that does not exceed 3300 feet (1000 meters).
- f) Installation on a rigid mounting surface.
- g) Installation in areas or supplementary enclosures, which do not seriously interfere with the ventilation of the motor.

4 ENCLOSURES

General purpose horizontal motors for indoor operation in a clean environment can be ODP (Open Dripproof).

General purpose horizontal motors for outdoor operation or located in hostile non-hazardous environments shall be "Enclosed" or "Weather Protected".

All motors in hazardous locations shall be approved for the application and meet the Class and Group as required by the area classification.

5 ELECTRICAL DESIGN

Motors shall be rated continuous duty.

Insulation system shall be rated minimum Class B (130°C).

Maximum temperature rise by resistance at rated HP shall not exceed Class B limits (80°C).

For motors rated at 1.15 Service Factor or higher, the maximum temperature rise by resistance at the rated Service Factor load shall not exceed Class F limits (115°C).

For medium motors the speed/torque and speed/current characteristics shall comply with NEMA Design A or B, as specified on the request for quote.

Motors shall be suitable for full voltage starting, unless otherwise specified.

Motors shall meet the requirements of NEMA PREMIUM[®]. (See Annexes.)

Motors applied to variable frequency drives shall adhere to NEMA MG 1, Part 30 *Application Considerations for Constant Speed Motors Used on a Sinusoidal Bus with Harmonic Content and General Purpose Motors Used*