Setting Standards for Excellence

To: Current Holders of MG 1-2006
MOTORS AND GENERATORS
Section I, Part 6
Section II, Part 12

From: NEMA Communications Department

Date: April 10, 2007

Re: Errata for
MG 1-2006
MOTORS AND GENERATORS
Section I, Part 6
Section II, Part 12

The present publication of

NEMA, MG 1-2006 MOTORS AND GENERATORS
Section I, Part 6 REFERENCED STANDARDS AND DEFINITIONS
Section II, Part 12 TESTS AND PERFORMANCE—AC MOTORS

has the following errata:

Please insert the attached errata into your standard.

Section I, Part 6 REFERENCED STANDARDS AND DEFINITIONS, Pages 5–7

Section II, Part 12 TESTS AND PERFORMANCE—AC MOTORS, Pages 29–37

Thank you for your attention in this matter.

© Copyright 2007 by the National Electrical Manufacturers Association.

Copyright National Electrical Manufacturers Association
Provided by IHS under license with NEMA
No reproduction or networking permitted without license from IHS Not for Resale

2007 ERRATA TO

NEMA STANDARDS PUBLICATION MG 1-2006

MOTORS AND GENERATORS

Published by

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

www.nema.org

© Copyright 2007 by the 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

--`,,```,,,,````-`-`,,`,,`,`,,`---

Copyright National Electrical Manufacturers Association
Provided by IHS under license with NEMA
No reproduction or networking permitted without license from IHS

Not for Resale

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, 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 of your particular purposes or needs. NEMA does not undertake to guarantee the performance of any individual manufacturer 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.

© Copyright 2007 by the National Electrical Manufacturers Association.

Copyright National Electrical Manufacturers Association
Provided by IHS under license with NEMA
No reproduction or networking permitted without license from IHS
Not for Resale

1.5.2 Direct-Current Large Machine

A direct-current large machine is a machine having a continuous rating greater than 1.25 horsepower per rpm for motors or 1.0 kilowatt per rpm for generators.

CLASSIFICATION ACCORDING TO APPLICATION

(Some of the definitions in this section apply only to specific types or sizes of machines.)

1.6 GENERAL PURPOSE MOTOR

1.6.1 General-Purpose Alternating-Current Motor

A general-purpose alternating-current motor is an induction motor, rated 500 horsepower and less, which incorporates all of the following:

a. Open or enclosed construction
b. Rated continuous duty
c. Service factor in accordance with 12.51
d. Class A or higher rated insulation system with a temperature rise not exceeding that specified in 12.42 for Class A insulation for small motors or Class B or higher rated insulation system with a temperature rise not exceeding that specified in 12.43 for Class B insulation for medium motors.

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.

1.6.2 General-Purpose Direct-Current Small Motor

A general-purpose direct-current small motor is a small motor of mechanical construction suitable for general use under usual service conditions and has ratings and constructional and performance characteristics applying to direct-current small motors as given in Parts 4, 10, 12, and 14.

1.7 GENERAL-PURPOSE GENERATOR

A general-purpose generator is a synchronous generator of mechanical construction suitable for general use under usual service conditions and has ratings and constructional and performance characteristics as given in Part 32.

1.8 INDUSTRIAL SMALL MOTOR

An industrial small motor is an alternating-current or direct-current motor built in either NEMA frame 42, 48, or 56 suitable for industrial use.

It is designed in standard ratings with standard operating characteristics for use under usual service conditions without restriction to a particular application or type of application**.**

1.9 INDUSTRIAL DIRECT-CURRENT MEDIUM MOTOR

An industrial direct-current motor is a medium motor of mechanical construction suitable for industrial use under usual service conditions and has ratings and constructional and performance characteristics applying to direct current medium motors as given in Parts 4, 10, 12, and 14.

1.10 INDUSTRIAL DIRECT-CURRENT GENERATOR

An industrial direct-current generator is a generator of mechanical construction suitable for industrial use under usual service conditions and has ratings and constructional and performance characteristics applying to direct current generators as given in Part 4 and 15.

© Copyright 2006 by the National Electrical Manufacturers Association.

Copyright National Electrical Manufacturers Association
Provided by IHS under license with NEMA
No reproduction or networking permitted without license from IHS Not for Resale

1.11 DEFINITE-PURPOSE MOTOR

A definite-purpose motor is any motor designed in standard ratings with standard operating characteristics or mechanical construction for use under service conditions other than usual or for use on a particular type of application.

1.12 GENERAL INDUSTRIAL MOTORS

A general industrial motor is a large dc motor of mechanical construction suitable for general industrial use (excluding metal rolling mill service), which may include operation at speeds above base speed by field weakening, and has ratings and constructional and performance characteristics applying to general industrial motors as given in Part 23.

1.13 METAL ROLLING MILL MOTORS

A metal rolling mill motor is a large dc motor of mechanical construction suitable for metal rolling mill service (except for reversing hot-mill service) and has ratings and constructional and performance characteristics applying to metal rolling mill motors as given in Part 23.

1.14 REVERSING HOT MILL MOTORS

A reversing hot mill motor is a large dc motor of mechanical construction suitable for reversing hot mill service, such as blooming and slabbing mills, and has ratings and constructional and performance characteristics applying to reversing hot mill motors as given in Part 23.

1.15 SPECIAL-PURPOSE MOTOR

A special-purpose motor is a motor with special operating characteristics or special mechanical construction, or both, designed for a particular application and not falling within the definition of a general-purpose or definite-purpose motor.

1.16 NEMA PREMIUM® EFFICIENCY ELECTRIC MOTOR 60 HZ

1.16.1 A 60 Hz

NEMA Premium® Efficiency electric motor is a continuous rated, single-speed, polyphase, squirrel-cage induction motor of 2, 4, or 6 pole design meeting the performance requirements of Design A in 1.19.1.1 or Design B in 1.19.1.2 and having a nominal full load efficiency not less than shown in 12.60.1. or 12.60.2.

1.16.2 50 Hz

A 50 Hz NEMA Premium® Efficiency electric motor is a continuous rated, single-speed, polyphase, squirrel-cage induction motor of 2, 4, or 6 pole design meeting the performance requirements of Design A in 1.19.1.1 or Design B in 1.19.1.2 and having a nominal full load efficiency not less than shown in 12.60.3.

© Copyright 2007 by the National Electrical Manufacturers Association.

Copyright National Electrical Manufacturers Association
Provided by IHS under license with NEMA
No reproduction or networking permitted without license from IHS
Not for Resale

CLASSIFICATION ACCORDING TO ELECTRICAL TYPE

1.17 GENERAL

1.17.1 Electric Motor

An electric motor is a machine that transforms electric power into mechanical power.

1.17.2 Electric Generator

An electric generator is a machine that transforms mechanical power into electric power.

1.17.3 Electric Machines

1.17.3.1 Asynchronous Machine

An asynchronous machine is an alternating-current machine in which the rotor does not turn at a synchronous speed.

© Copyright 2007 by the National Electrical Manufacturers Association.

--`,,```,,,,````-`-`,,`,,`,`,,`---

Copyright National Electrical Manufacturers Association
Provided by IHS under license with NEMA
No reproduction or networking permitted without license from IHS
Not for Resale

This page is intentionally left blank

© Copyright 2007 by the National Electrical Manufacturers Association.

--`,,```,,,,````-`-`,,`,,`,`,,`---

Copyright National Electrical Manufacturers Association
Provided by IHS under license with NEMA
No reproduction or networking permitted without license from IHS

Not for Resale

12.60 EFFICIENCY LEVEL OF NEMA PREMIUM® EFFICIENCY ELECTRIC MOTORS

12.60.1 60 Hz MOTORS RATED 600 VOLTS OR LESS (RANDOM WOUND)

The nominal full-load efficiency of random wound NEMA Premium® Efficiency electric motors rated 600 volts or less determined in accordance with 12.58.1, identified on the nameplate in accordance with 12.58.2, and having a minimum efficiency in accordance with Table 12-10 shall equal or exceed the values listed in Table 12-12.

12.60.2 60 Hz MOTORS RATED MEDIUM VOLTAGE, 5000 VOLTS OR LESS, (FORM WOUND)

The nominal full-load efficiency of form wound NEMA Premium® Efficiency electric motors rated at a medium voltage of 5000 volts or less determined in accordance with 12.58.1, identified on the nameplate in accordance with 12.58.2, and having a minimum efficiency in accordance with Table 12-10 shall equal or exceed the values listed in Table 12-13.

12.60.3 50 HZ MOTORS RATED 400 VOLTS OR LESS (RANDOM WOUND)

The nominal full-load efficiency of random wound 50 Hz NEMA Premium® Efficiency electric motors rated 400 volts or less determined in accordance with 12.58.1, identified on the nameplate in accordance with 12.58.2, and having a minimum efficiency in accordance with Table 12-10 shall equal or exceed the values listed in Table 12-14.

12.61 REPORT OF TEST FOR TESTS ON INDUCTION MOTORS

For reporting routine tests on induction motors, see IEEE Standard 112, Appendix A.

© Copyright 2007 by the National Electrical Manufacturers Association.

Copyright National Electrical Manufacturers Association
Provided by IHS under license with NEMA
No reproduction or networking permitted without license from IHS
Not for Resale

Table 12-11
FULL-LOAD EFFICIENCIES OF ENERGY EFFICIENT MOTORS

OPEN MOTORS								
	2 POLE		4 POLE		6 POLE		8 POLE	
Hp	Nominal Efficiency	Minimum Efficiency	Nominal Efficiency	Minimum Efficiency	Nominal Efficiency	Minimum Efficiency	Nominal Efficiency	Minimum Efficiency
1	...	...	82.5	80.0	80.0	77.0	74.0	70.0
1.5	82.5	80.0	84.0	81.5	84.0	81.5	75.5	72.0
2	84.0	81.5	84.0	81.5	85.5	82.5	85.5	82.5
3	84.0	81.5	86.5	84.0	86.5	84.0	86.5	84.0
5	85.5	82.5	87.5	85.5	87.5	85.5	87.5	85.5
7.5	87.5	85.5	88.5	86.5	88.5	86.5	88.5	86.5
10	88.5	86.5	89.5	87.5	90.2	88.5	89.5	87.5
15	89.5	87.5	91.0	89.5	90.2	88.5	89.5	87.5
20	90.2	88.5	91.0	89.5	91.0	89.5	90.2	88.5
25	91.0	89.5	91.7	90.2	91.7	90.2	90.2	88.5
30	91.0	89.5	92.4	91.0	92.4	91.0	91.0	89.5
40	91.7	90.2	93.0	91.7	93.0	91.7	91.0	89.5
50	92.4	91.0	93.0	91.7	93.0	91.7	91.7	90.2
60	93.0	91.7	93.6	92.4	93.6	92.4	92.4	91.0
75	93.0	91.7	94.1	93.0	93.6	92.4	93.6	92.4
100	93.0	91.7	94.1	93.0	94.1	93.0	93.6	92.4
125	93.6	92.4	94.5	93.6	94.1	93.0	93.6	92.4
150	93.6	92.4	95.0	94.1	94.5	93.6	93.6	92.4
200	94.5	93.6	95.0	94.1	94.5	93.6	93.6	92.4
250	94.5	93.6	95.4	94.5	95.4	94.5	94.5	93.6
300	95.0	94.1	95.4	94.5	95.4	94.5	…	…
350	95.0	94.1	95.4	94.5	95.4	94.5	…	…
400	95.4	94.5	95.4	94.5	…	…	…	…
450	95.8	95.0	95.8	95.0	…	…	…	…
500	95.8	95.0	95.8	95.0	…	…	…	…

Table 12-11 continued next page

Copyright National Electrical Manufacturers Association
Provided by IHS under license with NEMA
No reproduction or networking permitted without license from IHS

Not for Resale

Table 12-11 *(Continued)*
FULL-LOAD EFFICIENCIES OF ENERGY EFFICIENT MOTORS

ENCLOSED MOTORS

Hp	2 POLE		4 POLE		6 POLE		8 POLE	
	Nominal Efficiency	Minimum Efficiency	Nominal Efficiency	Minimum Efficiency	Nominal Efficiency	Minimum Efficiency	Nominal Efficiency	Minimum Efficiency
1.0	75.5	72.0	82.5	80.0	80.0	77.0	74.0	70.0
1.5	82.5	80.0	84.0	81.5	85.5	82.5	77.0	74.0
2.0	84.0	81.5	84.0	81.5	86.5	84.0	82.5	80.0
3.0	85.5	82.5	87.5	85.5	87.5	85.5	84.0	81.5
5.0	87.5	85.5	87.5	85.5	87.5	85.5	85.5	82.5
7.5	88.5	86.5	89.5	87.5	89.5	87.5	85.5	82.5
10.0	89.5	87.5	89.5	87.5	89.5	87.5	88.5	86.5
15.0	90.2	88.5	91.0	89.5	90.2	88.5	88.5	86.5
20.0	90.2	88.5	91.0	89.5	90.2	88.5	89.5	87.5
25.0	91.0	89.5	92.4	91.0	91.7	90.2	89.5	87.5
30.0	91.0	89.5	92.4	91.0	91.7	90.2	91.0	89.5
40.0	91.7	90.2	93.0	91.7	93.0	91.7	91.0	89.5
50.0	92.4	91.0	93.0	91.7	93.0	91.7	91.7	90.2
60.0	93.0	91.7	93.6	92.4	93.6	92.4	91.7	90.2
75.0	93.0	91.7	94.1	93.0	93.6	92.4	93.0	91.7
100.0	93.6	92.4	94.5	93.6	94.1	93.0	93.0	91.7
125.0	94.5	93.6	94.5	93.6	94.1	93.0	93.6	92.4
150.0	94.5	93.6	95.0	94.1	95.0	94.1	93.6	92.4
200.0	95.0	94.1	95.0	94.1	95.0	94.1	94.1	93.0
250.0	95.4	94.5	95.0	94.1	95.0	94.1	94.5	93.6
300.0	95.4	94.5	95.4	94.5	95.0	94.1	...	...
350.0	95.4	94.5	95.4	94.5	95.0	94.1	...	...
400.0	95.4	94.5	95.4	94.5	...	...	...	...
450.0	95.4	94.5	95.4	94.5	...	...	...	...
500.0	95.4	94.5	95.8	95.0	...	...	...	...

© Copyright 2007 by the National Electrical Manufacturers Association.

Copyright National Electrical Manufacturers Association
Provided by IHS under license with NEMA
No reproduction or networking permitted without license from IHS
Not for Resale

Table 12-12
FULL-LOAD EFFICIENCIES FOR 60 HZ NEMA PREMIUM® EFFICIENCY ELECTRIC MOTORS RATED 600 VOLTS OR LESS (RANDOM WOUND)

OPEN MOTORS						
	2 POLE		4 POLE		6 POLE	
HP	Nominal Efficiency	Minimum Efficiency	Nominal Efficiency	Minimum Efficiency	Nominal Efficiency	Minimum Efficiency
1	77.0	74.0	85.5	82.5	82.5	80.0
1.5	84.0	81.5	86.5	84.0	86.5	84.0
2	85.5	82.5	86.5	84.0	87.5	85.5
3	85.5	82.5	89.5	87.5	88.5	86.5
5	86.5	84.0	89.5	87.5	89.5	87.5
7.5	88.5	86.5	91.0	89.5	90.2	88.5
10	89.5	87.5	91.7	90.2	91.7	90.2
15	90.2	88.5	93.0	91.7	91.7	90.2
20	91.0	89.5	93.0	91.7	92.4	91.0
25	91.7	90.2	93.6	92.4	93.0	91.7
30	91.7	90.2	94.1	93.0	93.6	92.4
40	92.4	91.0	94.1	93.0	94.1	93.0
50	93.0	91.7	94.5	93.6	94.1	93.0
60	93.6	92.4	95.0	94.1	94.5	93.6
75	93.6	92.4	95.0	94.1	94.5	93.6
100	93.6	92.4	95.4	94.5	95.0	94.1
125	94.1	93.0	95.4	94.5	95.0	94.1
150	94.1	93.0	95.8	95.0	95.4	94.5
200	95.0	94.1	95.8	95.0	95.4	94.5
250	95.0	94.1	95.8	95.0	95.4	94.5
300	95.4	94.5	95.8	95.0	95.4	94.5
350	95.4	94.5	95.8	95.0	95.4	94.5
400	95.8	95.0	95.8	95.0	95.8	95.0
450	95.8	95.0	96.2	95.4	96.2	95.4
500	95.8	95.0	96.2	95.4	96.2	95.4

Table 12-12 continued next page

Copyright National Electrical Manufacturers Association
Provided by IHS under license with NEMA
No reproduction or networking permitted without license from IHS

Not for Resale

Table 12-12 *(Continued)*

FULL-LOAD EFFICIENCIES FOR 60 HZ NEMA PREMIUM® EFFICIENCY ELECTRIC MOTORS RATED 600 VOLTS OR LESS (RANDOM WOUND)

ENCLOSED MOTORS						
	2 POLE		4 POLE		6 POLE	
HP	Nominal Efficiency	Minimum Efficiency	Nominal Efficiency	Minimum Efficiency	Nominal Efficiency	Minimum Efficiency
1	77.0	74.0	85.5	82.5	82.5	80.0
1.5	84.0	81.5	86.5	84.0	87.5	85.5
2	85.5	82.5	86.5	84.0	88.5	86.5
3	86.5	84.0	89.5	87.5	89.5	87.5
5	88.5	86.5	89.5	87.5	89.5	87.5
7.5	89.5	87.5	91.7	90.2	91.0	89.5
10	90.2	88.5	91.7	90.2	91.0	89.5
15	91.0	89.5	92.4	91.0	91.7	90.2
20	91.0	89.5	93.0	91.7	91.7	90.2
25	91.7	90.2	93.6	92.4	93.0	91.7
30	91.7	90.2	93.6	92.4	93.0	91.7
40	92.4	91.0	94.1	93.0	94.1	93.0
50	93.0	91.7	94.5	93.6	94.1	93.0
60	93.6	92.4	95.0	94.1	94.5	93.6
75	93.6	92.4	95.4	94.5	94.5	93.6
100	94.1	93.0	95.4	94.5	95.0	94.1
125	95.0	94.1	95.4	94.5	95.0	94.1
150	95.0	94.1	95.8	95.0	95.8	95.0
200	95.4	94.5	96.2	95.4	95.8	95.0
250	95.8	95.0	96.2	95.4	95.8	95.0
300	95.8	95.0	96.2	95.4	95.8	95.0
350	95.8	95.0	96.2	95.4	95.8	95.0
400	95.8	95.0	96.2	95.4	95.8	95.0
450	95.8	95.0	96.2	95.4	95.8	95.0
500	95.8	95.0	96.2	95.4	95.8	95.0

© Copyright 2007 by the National Electrical Manufacturers Association.

Copyright National Electrical Manufacturers Association
Provided by IHS under license with NEMA
No reproduction or networking permitted without license from IHS
Not for Resale

Table 12-13

FULL-LOAD EFFICIENCIES FOR 60 HZ NEMA PREMIUM® EFFICIENCY ELECTRIC MOTORS RATED 5000 VOLTS OR LESS (FORM WOUND)

OPEN MOTORS

HP	2 POLE		4 POLE		6 POLE	
	Nominal Efficiency	Minimum Efficiency	Nominal Efficiency	Minimum Efficiency	Nominal Efficiency	Minimum Efficiency
250	94.5	93.6	95.0	94.1	95.0	94.1
300	94.5	93.6	95.0	94.1	95.0	94.1
350	94.5	93.6	95.0	94.1	95.0	94.1
400	94.5	93.6	95.0	94.1	95.0	94.1
450	94.5	93.6	95.0	94.1	95.0	94.1
500	94.5	93.6	95.0	94.1	95.0	94.1

ENCLOSED MOTORS

HP	2 POLE		4 POLE		6 POLE	
	Nominal Efficiency	Minimum Efficiency	Nominal Efficiency	Minimum Efficiency	Nominal Efficiency	Minimum Efficiency
250	95.0	94.1	95.0	94.1	95.0	94.1
300	95.0	94.1	95.0	94.1	95.0	94.1
350	95.0	94.1	95.0	94.1	95.0	94.1
400	95.0	94.1	95.0	94.1	95.0	94.1
450	95.0	94.1	95.0	94.1	95.0	94.1
500	95.0	94.1	95.0	94.1	95.0	94.1

Copyright National Electrical Manufacturers Association
Provided by IHS under license with NEMA
No reproduction or networking permitted without license from IHS
Not for Resale

Table 12-14

FULL-LOAD EFFICIENCIES FOR 50 HZ NEMA PREMIUM® EFFICIENCY ELECTRIC MOTORS RATED 600 VOLTS OR LESS (RANDOM WOUND)

	OPEN MOTORS					
	2 POLE		4 POLE		6 POLE	
HP	Nominal Efficiency	Minimum Efficiency	Nominal Efficiency	Minimum Efficiency	Nominal Efficiency	Minimum Efficiency
1	75.5	72.0	84.0	81.5	81.5	78.5
1.5	82.5	80.0	85.5	82.5	85.5	82.5
2	84.0	81.5	85.5	82.5	86.5	84.0
3	84.0	81.5	88.5	86.5	87.5	85.5
5	85.5	82.5	88.5	86.5	88.5	86.5
7.5	87.5	85.5	90.2	88.5	89.5	87.5
10	88.5	86.5	91.0	89.5	91.0	89.5
15	89.5	87.5	92.4	91.0	91.0	89.5
20	90.2	88.5	92.4	91.0	91.7	90.2
25	91.0	89.5	93.0	91.7	92.4	91.0
30	91.0	89.5	93.6	92.4	93.0	91.7
40	91.7	90.2	93.6	92.4	93.6	92.4
50	92.4	91.0	94.1	93.0	93.6	92.4
60	93.0	91.7	94.5	93.6	94.1	93.0
75	93.0	91.7	94.5	93.6	94.1	93.0
100	93.0	91.7	95.0	94.1	94.5	93.6
125	93.6	92.4	95.0	94.1	94.5	93.6
150	93.6	92.4	95.4	94.5	95.0	94.1
200	94.5	93.6	95.4	94.5	95.0	94.1
250	94.5	93.6	95.4	94.5	95.0	94.1
300	95.0	94.1	95.4	94.5	95.0	94.1
350	95.0	94.1	95.4	94.5	95.0	94.1
400	95.4	94.5	95.4	94.5	95.4	94.5
450	95.4	94.5	95.8	95.0	95.8	95.0
500	95.4	94.5	95.8	95.0	95.8	95.0

Table 12-14 continued next page

© Copyright 2007 by the National Electrical Manufacturers Association.

Copyright National Electrical Manufacturers Association
Provided by IHS under license with NEMA
No reproduction or networking permitted without license from IHS

Not for Resale

Table 12-14 *(Continued)*

FULL-LOAD EFFICIENCIES FOR 50 HZ NEMA PREMIUM® EFFICIENCY ELECTRIC MOTORS RATED 600 VOLTS OR LESS (RANDOM WOUND)

ENCLOSED MOTORS						
	2 POLE		4 POLE		6 POLE	
HP	Nominal Efficiency	Minimum Efficiency	Nominal Efficiency	Minimum Efficiency	Nominal Efficiency	Minimum Efficiency
1	75.5	72.0	84.0	81.5	81.5	78.5
1.5	82.5	80.0	85.5	82.5	86.5	84.0
2	84.0	81.5	85.5	82.5	87.5	85.5
3	85.5	82.5	88.5	86.5	88.5	86.5
5	87.5	85.5	88.5	86.5	88.5	86.5
7.5	88.5	86.5	91.0	89.5	90.2	88.5
10	89.5	87.5	91.0	89.5	90.2	88.5
15	90.2	88.5	91.7	90.2	91.0	89.5
20	90.2	88.5	92.4	91.0	91.0	89.5
25	91.0	89.5	93.0	91.7	92.4	91.0
30	91.0	89.5	93.0	91.7	92.4	91.0
40	91.7	90.2	93.6	92.4	93.6	92.4
50	92.4	91.0	94.1	93.0	93.6	92.4
60	93.0	91.7	94.5	93.6	94.1	93.0
75	93.0	91.7	95.0	94.1	94.1	93.0
100	93.6	92.4	95.0	94.1	94.5	93.6
125	94.5	93.6	95.0	94.1	94.5	93.6
150	94.5	93.6	95.4	94.5	95.4	94.5
200	95.0	94.1	95.8	95.0	95.4	94.5
250	95.4	94.5	95.8	95.0	95.4	94.5
300	95.4	94.5	95.8	95.0	95.4	94.5
350	95.4	94.5	95.8	95.0	95.4	94.5
400	95.4	94.5	95.8	95.0	95.4	94.5
450	95.4	94.5	95.8	95.0	95.4	94.5
500	95.4	94.5	95.8	95.0	95.4	94.5

Copyright National Electrical Manufacturers Association
Provided by IHS under license with NEMA
No reproduction or networking permitted without license from IHS

Not for Resale

12.62 MACHINE WITH ENCAPSULATED OR SEALED WINDINGS—CONFORMANCE TESTS

An alternating-current squirrel-cage machine with encapsulated or sealed windings shall be capable of passing the tests listed below.

After the stator winding is completed, join all leads together leaving enough length to avoid creepage to terminals and perform the following tests in the sequence indicated:

a. The encapsulated or sealed stator shall be tested while all insulated parts are submerged in a tank of water containing a wetting agent. The wetting agent shall be non-ionic and shall be added in a proportion sufficient to reduce the surface tension of water to a value of 31 dyn/cm (3.1μN/m) or less at 25°C.
b. Using 500 volts direct-current, take a 10 minute insulation resistance measurement. The insulation resistance value shall be not less than the minimum recommended in IEEE Std 43. (Insulation resistance in megohms $\geq$ machine rated kilovolts plus 1.)
c. Subject the winding to a 60-hertz high potential test of 1.15 times the rated line-to-line rms voltage for 1 minute. Water must be at ground potential during this test.
d. Using 500 volts direct-current, take a 1 minute insulation resistance measurement. The insulation resistance value shall be not less than the minimum recommended in IEEE Std 43. (Insulation resistance in megohms $\geq$ machine rated kilovolts plus 1.)
e. Remove winding from water, rinse if necessary, dry, and apply other tests as may be required.

12.63 MACHINE WITH MOISTURE RESISTANT WINDINGS—CONFORMANCE TEST

An alternating-current squirrel-cage machine with moisture resistant windings shall be capable of passing the following test:

a. After the stator is completed, join all leads together and place it in a chamber with 100 percent relative humidity and 40°C temperature for 168 hours, during which time visible condensation shall be standing on the winding.
b. After 168 hours remove the stator winding from the chamber and within 5 minutes using 500 volt direct-current take a 1 minute insulation resistance measurement following the procedure as outlined in IEEE Std 43. The insulation resistance value shall be not less than 1.5 megohms.

NOTES

1—The above test is recommended as a test on a representative sample or prototype and should not be construed as a production test.

2—The sealed winding conformance test in 12.63 shall be permitted to be used in place of this test procedure to demonstrate moisture resistance of a prototype.

© Copyright 2007 by the National Electrical Manufacturers Association.

Copyright National Electrical Manufacturers Association
Provided by IHS under license with NEMA
No reproduction or networking permitted without license from IHS
Not for Resale