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ANSI/NEMA MG 1-2016 (Revision 1, 2018)

Motors and Generators

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Summary of Changes for MG 1-2016 Revision 1 (2018)

Changes to MG 1-2016 for Revision 1-2018 are marked by a double black line to the left of the changed material.

|| Example of change made for MG 1-2016 Revision 1-2018.

Note: Where text has been revised in more than one version, only the most recent revision is marked.

Contents

Table of Contents was revised due to added sections and repagination

Section I, Part 1

1.1 Added reference to ISO 20816

Section I, Part 7

7.3 Updated list of referenced documents

7.4.1 Revised description of bearing housing vibration

7.4.2 Revision to reference document numbering

7.5 Revision to expand description of measuring equipment capability

7.6.2 Revision to title and expanded description of resilient mounting/free suspension

Figure 7-1 Revised figure to harmonize with IEC 60034-14

7.6.3 Revised description of rigid mounting of horizontal and vertical machines

7.7.1 Revised description of shaft key aspects of measurement

7.7.2 Revised to prohibit use of multi-directional sensors, with note on allowable measurement points

7.8.1 Revised general considerations for limits on bearing housing vibration, including addition of 5 informational notes.

7.8.5 Revised to replace requirements for twice line frequency vibration of two-pole induction machines to harmonize with IEC 60034-14

7.9.1 Revised general considerations for limits of relative shaft vibration

Section II, Part 12

12.35.1 Revised to reference separate locked-rotor current tables for 60 Hz Design B fire pump motors and 60 Hz Design B, C, and D motors other than for fire pumps

Table 12-1A Added to specify locked-rotor current limits for 60 Hz Design B fire pump motors

Table 12-1B Added to specify locked-rotor current limits for 60 Hz Design B, C, and D motors other than fire pump motors, including description of the values of locked-rotor amperes

12.35.2-.3 Revised to reference separate locked-rotor current tables for 50 Hz Design B fire pump motors and 50 Hz Design B, C, and D motors other than for fire pumps

Table 12-1C Added to specify locked-rotor current limits for 50 Hz Design B fire pump motors

Table 12-1D Added to specify locked-rotor current limits for 50 Hz Design B, C, and D motors other than fire pump motors, including description of the values of locked-rotor amperes

12.50	Revised to clarify that the motor shall meet all performance requirements of MG 1 at the voltage that appears in the Rated Voltage field; revised to clarify that compliance with torque and nameplate nominal efficiency requirements is not required at voltages other than in the Rated Voltage field
12.59	Revised title and text to remove the description “random wound”
12.60.1	Revised title to remove the description “random wound”
12.60.1.4	Revised text to remove the description “random wound”
12.60.2	Revised title and text to specify a voltage rating range of 601–5000 V, and that this applies to polyphase medium motors
12.60.3	Revised title and text to indicate that requirements apply to polyphase motors
Table 12-11	Revised title to apply to 60 Hz motors; “random wound” deleted
Table 12-12	Revised title to apply to three-phase motors; “random wound” deleted
Table 12-13	Revised title to apply to motors rated 601–5000 V
Table 12-14	Revised title to delete “random wound”
Table 12-15	Revised title to delete “random wound”
Table 12-16	Revised title to apply to three-phase motors; “random wound” deleted
Table 12-17	Revised title to apply to motors rated 601–5000 V; “form wound” deleted

Section IV, Part 30

30.2.2.9	Revised title and text to describe the application of coupling capacitors
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Section IV, Part 31

31.3.8	Revised to expand description of variable speed duty rating, with the addition of footnotes 1, 2, and 3
31.4.1.1	Revised to clarify the description of the maximum temperature rise limits for variable speed duty definite-purpose inverter-fed polyphase motors
31.4.1.2	Revised text and formula, with the addition of footnote 4
31.4.1.3	Revised text for clarity
31.4.3.4	Revised title and text to describe the application of coupling capacitors
Figure 31-2	Deleted and replaced
Figure 31-3	Added

Summary of Changes for MG 1-2016 Edition

Changes for the MG 1-2016 edition, made since publication of the 2014 edition, are marked by a black line to the left of the changed material.

Example of change made for MG 1-2016

Section II, Part 10

10.40.2	Addition/Revision of Superscripts.
10.40.2	Revision of Superscripts from ² to ¹ in items d, and e.

Section II, Part 12

12.0	Corrected Hp rating from 120 to 125
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12.35.1 Table	Revised table to include an additional column (and footnote) for Locked-Rotor kVA Cod
Table 12-1	Revised to including ½ Hp and by adding additional column (and Footnote) for Locked-Rotor kVA Code.
12.42.2	Added notes referencing air-cooling
12.43	Added notes referencing air-cooling
12.58.1	Deleted Superscripts
12.58.2	Revised to accommodate 50 Hz efficiency ratings. Addition/Revision of Superscripts.
12.60	Revision of title to denote Premium Efficiency
12.60.1	Added Rating to title and deleted paragraph as not applicable
12.60.1.4	Revised paragraph to include 60 Hz and included reference to Table 12-16.
12.60.2	Revised paragraph for clarity and changed premium efficient to premium efficiency.
12.60.3	Revised paragraph for clarity purposes.
12.61	Relocated to follow table 12-21
Table 12-14	Corrected table by removing strikeouts in 6 pole efficiency column

Section II, Part 14

14.3 Addition of items 9 and 10 under letter a.

Section II, Part 18

Table 2, 18.250 Correction of frame designations

Section III, Part 20

20.8	Addition/Revision of notes
20.21.1	Addition/Revision of notes
20.21. A	Revision of section for inclusion of 50 Hz efficiency and clarification purposes
20.21. C.1	Revised to change premium efficient to premium efficiency
20.21. C.2	Revised to change premium efficient to premium efficiency
20.21. C.3	Revised paragraph for clarity and changed premium efficient to premium efficiency.
20.21. C.4	Deleted paragraph as information is already covered in 20.21.C.1
20.25. C.1	Addition of Superscript 3 and associated note.

Section III, Part 21

21.10	Addition of notes related to cooling air
21.28.3	Addition of items 9 and 10 under letter a.

Section III, Part 23

23.25.3 Addition of items 9 and 10 under letter a.

Section III, Part 24

24.80.3 Addition of items 9 and 10 under letter a.

Section IV, Part 31

- 31.1.3 Addition of items 9 and 10 under letter a.
- 31.4.4.2 Revision/addition of Paragraphs, notes and tables

Section IV, Part 32

- 32.33.3 Addition of items 9 and 10 under letter a.

Section IV, Part 32

- 33.4.1.2 Addition of items 9 and 10 under letter a.

Changes for MG 1-2016 are not identified. Changes made for the MG 1-2014 revision are identified here.

Section I, Part 1

- 1.1 Revised text, updated, and occasionally added references
- 1.19.1.2 Updated references to subsections
- 1.27.2 Updated references to subsections
- 1.27.2 Added footnote
- 1.41.2 Reference to added clause
- 1.41.3 Reference to added clause
- 1.54 Revised and redefined

Section I, Part 4

- 4.4.8 Added subtitle

Section II, Part 10

- 10.39.1 Addition of letter m to Nameplate Marking Requirement

Section II, Part 12

- 12.31 Revised and added characteristics
- 12.58.1 Added references, revised determination of Motor Efficiency and Losses, deleted outdated information, added footnotes
- 12.58.2 Added and revised to include Design N, Design L and Design M single-speed single-phase squirrel-cage small motors, added efficiency levels to Table 12-10
- 12.59 Revised title to Efficiency Levels of Energy-Efficient Polyphase Squirrel-Cage Random Wound Induction Motors Rated 600 Volts or Less at 60 Hz and added new paragraph
- 12.60 Revised title to Efficiency Levels of Premium Efficiency Random Wound Electric Motors Rated 600 Volts or Less at 60 Hz
- 12.60.1 Revised title to Random Wound Electric Motor, added paragraph
- 12.60.1.1 Added new subsection title Single-Phase Capacitor-Start Induction-Run or Capacitor-Start Capacitor-Run Small Motors and paragraph
- 12.60.1.2 Added new subsection title Single-Phase Capacitor-Start Capacitor-Run Small Motors and paragraph

- 12.60.1.3 Added new subsection title Polyphase Small Motors and paragraph
- 12.60.1.4 Added new subsection title Polyphase Medium Motors and paragraph
- 12.60.2 Revised 60 Hz Motors Rated Medium Voltage, 5000 Volts or Less (Form Wound) and paragraph
- 12.60.3 Revised 50 Hz Motors Rated 600 Volts or Less (Random Wound), paragraph, revised formulas, added 8-Pole category to table, revised values
- 12.61 Revised Table 12-11 title, revised Table 12-12, revised Table 12-13, deleted data in Table 12-14, added Table 12-15, added Table 12-16, added Table 12-17, added Table 12-18, added Table 12-19, added Table 12-20, added Table 12-21

Section III, Part 20

- 20.21 Addition of kW Values
- 20.21.1 Addition of subtitle, addition of kW Values
- 20.21.A Revision of referenced paragraphs
- 20.21.B Revised paragraph, added Table 20-A
- 20.21.C Revised paragraph, added Table 20-B
- 20.21.C.2 Revised paragraphs, added Table 20-C
- 20.21.C.3 Revised paragraphs, added Table 20-D
- 20.21.C.4 Added paragraph, added Table 20-E, Table 20-F, Table 20-G
- 20.25.1 Revised Nameplate Marking requirement by the addition of I (NEMA nominal efficiency)

Section IV, Part 31

- 31.3.5 Simplified text
- 31.4.4.3 Revised paragraph for clarification purposes

Summary of Changes Made for the MG 1-2009 Edition, Revision 2-2011

Changes to MG 1-2009 made for Revision 2-2011 are marked by a teal line to the left of the changed material

Note: Where text has been revised in more than one version, only the most recent is color-coded.

Example of change made for MG 1-2011

Part I, Section I

- 1.41.2 Addition of or 20.21 B
- 1.41.3 Addition of or 20.21 C

Part 12, Section II

- 12.59 Addition of Random Wound
- Table 12-11 Addition of (Random Wound) to open and enclosed motor table title
- Table 12-12 Removed open and enclosed motor table efficiency values for 6 pole 300-500 HP motors and added 8 pole efficiency values
- Table 12-13 Removed table efficiency values for 6 pole 400, 450 and 500 HP motors and added 8 pole efficiency values

Table 12-14 Removed efficiency values for 6 pole 400, 450 and 500 HP motors

Part 20, Section III

20.21	Revised
20.21.A	Added efficiency of polyphase squirrel cage large motors with continuous ratings
20.21.B	Added efficiency levels of energy efficient polyphase squirrel-cage random wound large induction motors
Table 20-A	Addition of full load efficiency table
20.21.C	Addition of efficiency level of premium efficiency large electric motors
20.21.C.1	Addition of 60 Hz motors rated 600 volts or less
Table 20-B	Addition of full load premium efficiency table
20.21.C.2	Addition of 60 Hz motors rated 5000 volts or less
Table 20-C	Addition of full load efficiency values for 60 Hz premium efficiency of motors rated 5000 Volts or less
20.21.C.3	Addition of 50 Hz motors rated 600 volts or less
Table 20-D	Addition of full load efficiency values for 50 Hz premium efficiency motors 600 volts or less
20.25.1	Addition of item I

Section IV, Part 30

31.1.3 Addition of items 9 and 10 under letter a.

Section IV, Part 31

31.1.3 Addition of items 9 and 10 under letter a.

31.4.4.2 Revision/addition of Paragraphs, notes and tables

Summary of Changes Made for the MG 1-2009 Edition, Revision 1-2010

Changes to MG 1-2009 for Revision 1-2010 are marked by an orange line to the left of the changed material

Note: Where text has been revised in more than one version, only the most recent is color-coded.

Example of change made for MG 1-2009, Revision 1-2010

Section I, Part 7

7.4.2	Replaced "inches" with "mils"
7.6.1	Revised text
Figure 7-1	Renamed figure
Figure 7-1	Revised text
7.8.1	Revised table
Figure 7-6	Deleted section
Table 7-1	Deleted section
7.8.2	Deleted section
7.8.3	Revised reference to table

7.8.4	Revised reference to table
7.8.5	Revised reference to table
7.8.6	Revised text and reference to table
7.9.1	Deleted section
Table 7-2	Deleted table
Table 7-3	Deleted table
Table 7-4	Added table to replace Tables 7-2 and 7-3

Section II, Part 14

14.48	Added section
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Summary of Changes for the MG 1-2009 Edition

Changes made for the MG 1-2009 edition following publication of MG 1-2006 Revision 1 on November 20, 2007 are marked by a red line to the left of the changed material

Note: Where text has been revised in more than one version, only the most recent is color-coded.

Example of change made for MG 1-2009

Section I, Part 1

1.1	Added: Reference to IEC 60034-30-2008
1.16	Deleted section
1.41.3	Added: Premium Efficiency Motor

Section I, Part 2

2.2	Added: "To prevent confusion with the numerals 1 and 0, the letters "I" and "O" shall not be used." Updated footnote references added and revised markings Added: Reference to 2.67 for auxiliary devices
2.60.1.2	Revised Figure 2-48B for clarity
2.67	Added: Auxiliary Devices (entire section)

Section I, Part 4

Table 4-2	Dimension revised in column 6
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Section II, Part 10

Table 10-5	Adjusted table
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Section II, Part 12

12.41	In table, corrected synchronous speed of the 50 Hz machine
12.60.3	Added: Additional paragraphs, equation, and table
Table 12-14	Replaced Table 12-14
12.62	Revised 12.62a For 12.62b and 12.62d, revised minimum insulation resistance Added: Note Note 2: Updated reference to 20.8

Section II, Part 13

13.2 Revised frame size

Section II, Part 18

18.131 Figure 18-16: Dimension revised to 5.875

Section III, Part 20

20.18.1 Revised 20.18.1a
For 20.18.1b and 20.18.1d, revised minimum insulation resistance

20.18.2 Revised 20.18.2a
For 20.18.2b and 20.18.2d, revised minimum insulation resistance
Added: Note

Section IV, Part 30

Table 30-1 Revised footnote G.1 reference to 12.53

Summary of Changes for MG 1-2006 Revision 1

Changes made for MG 1-2006 Revision 1, published November 20, 2007 (including MG 1- 2006 Errata) are marked by a blue line to the left of the changed material

Note: Where text has been revised in more than one version, only the most recent is color-coded.

Example of change made for MG 1-2006 Revision 1

Contents

Entire Table of Contents was revised due to added sections and repagination

Section I, Part 1

1.16 NEMA Premium® Efficiency Electric Motor
Changed TM to ® Deleted general paragraph, added:

1.16.1 60 Hz

1.16.2 50 Hz

Section I, Part 2

2.2 Terminal Markings Footnotes

2.20.2 Induction Machines

2.24 Direction of Rotation

2.60.1.1 Terminal Markings Using "T"

2.60.1.2 Terminal Markings in Accordance with IEC 60034-8 Using U,
V, W Figure 2-48B
Added figure

2.61.6 Sixth Revised text

Section I, Part 3

3.1.8 Accessories and Components Inserted sentence

Section I, Part 4

- 4.9.4 Parallelism of Keyseats to Shaft Centerline
- 4.9.5 Lateral Displacement of Keyseats
- Figure 4-7 Corrected specifications
- 4.9.8 Shaft Extension Key(s)
- Table 4-7 Corrected specifications

Section II, Part 10 Ratings—AC Motors

- 10.38 Nameplate Temperature Ratings for Alternating-Current Small and Universal Motors Corrected Reference 12.42.3
- 10.40.1 Medium Single-Phase and Polyphase Squirrel-Cage Motors Corrected references in text and footnote 2
- 10.42.2 Polyphase Wound-Rotor Motors Corrected references in text

Section II, Part 10 Ratings—DC Motors

- 10.66.2 Small Motors Except Those Rated 1/20 Horsepower and Less Corrected footnote references

Section II, Part 12 Ratings Tests and Performance —AC Motors

- 12.42.4 Temperature Rise for Air-Cooled Machines for Ambients Lower than 40°C, but Not Below 0°C (Added section)
- 12.43.2 Temperature Rise for Air-Cooled Machines for Ambients Lower than 40°C, but Not Below 0°C (Added section)
- 12.60 Efficiency Level of Premium Efficiency Electric Motors (Added[®] throughout) Tables 12-12 through 12-14 (Added[®])
- 12-13 Full-Load Efficiencies for 60 Hz NEMA Premium[®] Efficiency Electric Motors (Added[®]), edited table title
- 12.62 Machine With Encapsulated or Sealed Windings—Conformance Tests (Clarified text in b and d)

Section II, Part 12 Ratings Tests and Performance —DC Motors

- 12.67.5 Temperature Rise for Air-Cooled Machines for Ambients Lower than 40°C, but Not Below 0°C
Added section

Section II, Part 15

- 15.41.2 Temperature Rise for Ambients Higher than 40°C
Added section

Section III, Part 20

- 20.8.1 Machines with a 1.0 Service Factor at Rated Load Corrected reference in footnote
- 20.8.2 Machines with a 1.15 Service Factor at Service Factor Load Corrected reference in footnote
- 20.18.1 Test for Stator Which Can Be Submerged Clarified text in b and d

20.18.2 Test for Stator Which Can Be Submerged Clarified text in b and d

Section III, Part 20

21.10.5 Temperature Rise for Air-Cooled Motors for Ambients Lower than 40°C,
but Not Below 0°C

Deleted lower ambients in a and b

21.28.3 Unusual Service Conditions Corrected references in subclause b.

21.37 Compressor Factors

Corrected reference

21.38 Surge Capabilities of AC Windings With Form-Wound Coils

Corrected reference

Section III, Part 23

23.9.3 Temperature Rise for Air-Cooled Machines for Ambients Lower than 40°C,
but Not Below 0°C

Added section

Section III, Part 24

24.40.3 Temperature Rise for Air-Cooled Machines for Ambients Lower than 40°C,
but Not Below 0°C

Added section

Section IV, Part 31

31.4.1.6 Temperature Rise for Air-Cooled Machines for Ambients Lower than 40°C,
but Not Below 0°C

Added section

Section IV, Part 32

Table 32-3 Corrected reference

32.6.2 Temperature Rise for Air-Cooled Machines for Ambients Lower than 40°C,
but Not Below 0°C

Added section

32.26 Generator Terminal Housing

Added "housing"

Section IV, Part 33

33.3.2.5 Temperature Rise for Air-Cooled Machines for Ambients Lower than 40°C,
but Not Below 0°C

Added section

Summary of Changes for MG 1-2006 Edition

Changes for the MG 1-2006 edition following publication of MG 1-2003 Revision 2, are marked by a purple line to the left of the changed material

Note: Where text has been revised in more than one version, only the most recent is color-coded.

Example of change made for MG 1-2003 Revision 2, published as MG 1-2006

Section I, Part 1

- 1.1 Referenced Standards updated to reflect current editions
- 1.70 Nameplate Marking - Entire section added

Section I, Part 3

- 3.1.8 Accessories and Components Correction
- 3.1.11 Tests of an Assembled Group of Machines and Apparatus Correction

Section I, Part 4

- 4.4.1 Dimensions for Alternating-Current Foot-Mounted Machines with Single Straight-Shaft Extension Notes correction
- 4.4.2 Notes correction
- 4.4.3 Notes correction
- 4.5.1 Notes correction
- 4.5.2 Notes correction
- 4.5.3 Notes
- 4.9.3 Bottom of Keyseat to Shaft Surface
- Figure 4-7 Corrected dimension
- 4.9.8 Shaft Extension Key(s) correction

Section I, Part 9

- 9.1 Scope: Changed “electrical motors” to “machines”
- 9.4 Methods of Measurement updated references to ANSI standards
- 9.4.2 “The” (added; “Either” deleted) method specified in ANSI S12.56 may be used.
- 9.6.2 Corrected reference to 9.6.2b
- Table 9-4 Updated ANSI standard references; added third column

Section II, Part 10

- 10.39 Corrected section reference
- 10.39.6 Deleted
- 10.40.1 Medium Single-Phase and Polyphase Squirrel-Cage Motors corrected section reference
- 10.66 Nameplate Marking correction
- 10.66.3 Medium Motors correction

Section II, Part 12

- 12.3 High-Potential Test Voltages for Universal, Induction, and Direct- Current Motors
 - Corrections to Effective Test Voltage
 - Corrections to Note 3—80 percent

- 12.35 Locked-Rotor Current of 3-Phase Small and Medium Squirrel-Cage Induction Motors
Deleted reference “60-hertz” and “rated at 230 volts”
- 12.40.1 Design A and B Motors
The pull-up torque of Design A and B
Added: 60- and 50-hertz
- 12.40.2 Design C Motors
The pull-up torque of Design C
Added: 60- and 50-hertz, single speed, polyphase squirrel-cage medium motors
- 12.54.1 Normal Starting Conditions
- 12.54.3 Considerations for Additional Starts
- Table 12-7 Squirrel-Cage Induction Motors
Revised specifications

Section II, Part 14

- 14.43 Aseismic Capability
- Table 14-1 Medium Motors—Polyphase Induction
Correction to conventional specifications

Section II, Part 15

- 15.12 Nameplate Marking

Section II Part 18

- Added and corrected headers throughout (editorial)
- Definite Purpose Machines
- Motors for Hermetic Refrigeration Compressors
- Small Motors for Air Conditioning Condensers and Evaporator Fans
- Small Motors for Gasoline Dispensing Pumps
- Small Motors for Home Laundry Equipment
- Medium AC Polyphase Elevator Motors
- Medium AC Crane Motors
- Medium Shell-Type Motors for Woodworking and Machine- Tool Applications
- 18.9 Variations
updated reference to 12.44
- 18.27 Variations from Rated Voltage and Rated Frequency
updated reference to 12.44
- 18.41 Variations from Rated Voltage and Rated Frequency
updated reference to 12.44
- 18.52 Variations from Rated Voltage and Rated Frequency
updated reference to 12.44
- 18.74 Variations from Rated Voltage and Rated Frequency
updated reference to 12.44
- 18.101 Variations from Rated Voltage and Rated Frequency
updated reference to 12.44
- 18.111 Nameplate Marking

- 18.116 Variations from Rated Voltage and Rated Frequency updated reference to 12.44
- 18.128 Variations from Rated Voltage and Rated Frequency updated reference to 12.44
- 18.142 Variations from Rated Voltage and Rated Frequency updated reference to 12.44
- 18.152 Variations from Rated Voltage and Rated Frequency updated reference to 12.44
- 18.153 Variations from Rated Voltage and Rated Frequency updated reference to 12.44
- 18.165 Variations from Rated Voltage and Rated Frequency updated reference to 12.44
- 18.166 Variations from Rated Voltage and Rated Frequency updated reference to 12.44
- 18.177 Variations from Rated Voltage and Rated Frequency updated reference to 12.44
- 18.178 Variations from Rated Voltage and Rated Frequency updated reference to 12.44
- 18.210 Variations from Rated Voltage and Rated Frequency updated reference to 12.44
- 18.211 Nameplate Marking
- 18.216 Nameplate Marking (Revised reference)
- 18.225 Variations from Rated Voltage and Rated Frequency updated reference to 12.44
- 18.230 Dimensions and Tolerances for Alternating-Current Open and Totally Enclosed Wound-Rotor Crane Motors Having Antifriction Bearings
Deleted note
- 18.247 Variations from Rated Voltage and Rated Frequency
Updated reference to 12.44
- 18.264 Nameplate Marking
- 18.269.1 AC Torque Motors
- 18.269.2 DC Torque Motors

Section III Part 20

- 20.5 Voltage Ratings (complete replacement of existing text)
- 20.7.3.1 General
- 20.8.5 Temperature Rise for Air-Cooled Machines for Ambients Lower than 40°C, but Not Below 0°C
Added section
- 20.10.3 Motor Torques When Customer Specifies A Custom Load Curve Added
- 20.10.4 Motor with 4.5 pu and Lower Locked-Rotor Current Added
- 20.11 Load Wk^2 for Polyphase Squirrel-Cage Induction Motors
- 20.24.2 Voltage Unbalance Defined Corrected specification in example
- 20.25 For some examples of additional information that may be included on the nameplate see 1.70.2.
- 20.25.5 Deleted

- 20.27 Embedded Temperature Detectors Revised text and dimensions in table
- 20.31.3 Units for Capability Requirements
- 20.35.8 Test Voltage Values

Section III Part 21

- 20.5 Voltage Ratings Revised specification
- 20.7.3.1 Voltage Ratings Added
- 20.8.5 Preferred motor output/voltage rating Added
- 21.8.3.1 General
- 21.10.5 Temperature Rise for Air-Cooled Motors for Ambients Lower than 40°C, but Not Below 0°C Added section
- 21.11 Deleted text
- 21.11.1 General Added
- 21.11.2 Motor Torques When Customer Supplies Load Curve
- 21.25 For some examples of additional information that may be included on the nameplate see 1.70.2. Added

Section III Part 23

- 23.13 Efficiency
- 23.24 For some examples of additional information that may be included on the nameplate see 1.70.2. Added

Section III Part 24

- 24.61 Nameplate Marking

Section IV Part 30

- 30.1.3 Power Factor Correction
- Fig. 30-2 The Effect of Reduced Cooling On The Torque Capability At Reduced Speeds of 60 Hz NEMA Design A and B Motors
- 30.2.2.2.4 Motor Torque During Operation Above Base Speed
- 30.2.2.8 Voltage Stress

Section IV Part 31

- 31.5.1 Variable Torque Applications

Section IV Part 30

- 32.24 Nameplate Marking Revised additional information

Section IV Part 30

- 33.3.2.2 Embedded Temperature Detectors

Index

Revised references throughout

Summary of Changes for MG 1-2003 Revision 1

Changes to MG 1-2003 for Revision 1-2004 are marked by a green line to the left of the changed material

Note: Where text has been revised in more than one version, only the most recent is color-coded.

■ Example of change made for MG 1-2003 Revision 1-2004

Section I, Part 5

5.1	Scope
5.3.4	Table 5-1
5.4.1	Indication of Degree of Protection
5.6	General Requirements for Tests
5.7	Tests for First Characteristic Numeral
Table 5-3	Test and Acceptance Conditions for First Characteristic Numeral
5.8.1	Test Conditions
5.8.2.1	Allowable Water Leakage
5.8.2.2	Post Water Electrical Test
Figure 5-1	Standard Test Finger Notes
Figure 5-2	Added
Figure 5-3	Added
Figure 5-4	Added
Figure 5-5	Added
Figure 5-6	Added

Section II, Part 12

12.51.1	General-Purpose Alternating-Current Motors of the Open Type
Table 12-4	NOTE: *In the case of polyphase squirrel-cage motors, these service factors apply only to Design A, B, and C motors.
12.51.2	Other Motors
12.58.2	Efficiency of Polyphase Squirrel-Cage Medium Motors with Continuous Ratings

Section II DC Small and Medium Motors

Added Header (editorial) to odd pages

Section II, Part 14

14.3	Unusual Service Conditions
	b. Operation where: (revised text)
	1. There is excessive departure from rated voltage or frequency, or both (see 12.44 for alternating current motors and 12.68 for direct-current motors)

3. The alternating-current supply voltage is unbalanced by more than 1 percent (see 12.45 and 14.36)

- 14.42.1 Application of V-Belt Sheaves To Alternating Current Motors Having Antifriction Bearings
- 14.42.2 Dimensions
 - 14.42.2.1 Selected Motor Ratings
 - 14.42.2.2 Other Motor Ratings
- 14.42.3 Radial Overhung Load Limitations

Table 14-1 NOTE: The width of the sheave shall be not greater than that required to transmit the indicated horsepower but in no case shall it be wider than $2(N-W) - 0.25$.

Table 14-1A Added 2004

Section III, Part 20

- 20.17.2 Test Voltage—Primary Windings Footnote

Section III, Part 21

- 21.35.1 Undamped Natural Frequency

Section IV, Part 30

- 30.0 Scope
 - 30.2.2.2.2 Torque Derating Based on Reduction in Cooling
 - 30.2.2.2.4 Motor Torque During Operation Above Base Speed

Figure 30-4 NOTE:

Figure 30-4 NOTE: a. Standard NEMA Design A and B motors in frames per Part 13.

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Revised references on pages 3, 4, 5



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Foreword

The standards appearing in this publication have been developed by the Motor and Generator Section and approved for publication as standards of the National Electrical Manufacturers Association. They are intended to assist users in the proper selection and application of motors and generators. These standards are revised periodically to provide for changes in user needs, advances in technology, and changing economic trends. All persons having experience in the selection, use, or manufacture of electric motors and generators are encouraged to submit recommendations that will improve the usefulness of these standards. Inquiries, comments, and proposed or recommended revisions should be submitted to the Motor and Generator Section by contacting:

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The best judgment of the Motor and Generator Section on the performance and construction of motors and generators is represented in these standards. They are based upon sound engineering principles, research, and records of test and field experience. Also involved is an appreciation of the problems of manufacture, installation, and use derived from consultation with and information obtained from manufacturers, users, inspection authorities, and others having specialized experience. For machines intended for general applications, information as to user needs was determined by the individual companies through normal commercial contact with users. For some motors intended for definite applications, the organizations that participated in the development of the standards are listed at the beginning of those definite-purpose motor standards.

Practical information concerning performance, safety, test, construction, and manufacture of alternating-current and direct-current motors and generators within the product scopes defined in the applicable section or sections of this publication is provided in these standards. Although some definite-purpose motors and generators are included, the standards do not apply to machines such as generators and traction motors for railroads, motors for mining locomotives, arc-welding generators, automotive accessory and toy motors and generators, machines mounted on airborne craft, etc.

In the preparation and revision of these standards, consideration has been given to the work of other organizations whose standards are in any way related to motors and generators. Credit is hereby given to all those standards organizations that may have been helpful in the preparation of this volume.

NEMA MG 1-2016 (Revised 2018) is a revision of MG 1-2014. Prior to publication, the NEMA Standards and Authorized Engineering Information appearing in this publication unchanged since the preceding edition were reaffirmed by the Motor and Generator Section.

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