## Section 8

### Special Information

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<th>Description</th>
<th>Page</th>
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</table>
National Electrical Manufacturers Association – NEMA

MG 1 – 2006 “Motors and Generators”

These standards provide practical information concerning performance, safety, test, construction and manufacturing of alternating current and direct current motors and generators within the product scopes outlined in the applicable sections.

MG 1 – 2006 is divided in the following way:

Section I – General Standards Applying to All Machines
   Part 1 – Referenced Standards and Deviations
   Part 2 – Terminal Markings
   Part 3 – High Potential Tests
   Part 4 – Dimensions, Tolerances, and Mounting
   Part 5 – Classifications by Degrees of Protection Provided by Enclosure
   Part 6 – Methods of Cooling (IC Code)
   Part 7 – Mechanical Vibration-measurement, Evaluation, and Limits

Section II – Small and Medium Machines (up to 500 HP, 3600 rpm open machines)
   Part 10 – Ratings – AC and DC Motors
   Part 12 – Tests and Performance – AC and DC Motors
   Part 13 – Frame Assignments for Alternating Current Integral Horsepower Motors
   Part 14 – Application Data – AC and DC Small and Medium Machines
   Part 15 – DC Generators
   Part 18 – Definite Purpose Machines

Section III – Large Machines (larger than 500HP 3600 rpm open machines)
   Part 20 – Large Machines – Induction Machines
   Part 21 – Large Machines – Synchronous Motors
   Part 23 – Large Machines – DC Motors Larger than 1.25 Horsepower per PRM, Open Type
   Part 24 – Large Machines – DC Generators Larger than 1.0 Kilowatt per RPM, Open Type Classification

Section IV – Performance Standards Applying to All Machines
   Part 30 – Application Considerations for Constant Speed Motors used on a Sinusoidal Bus with Harmonic Content and General Purpose Motors Used with Variable Voltage or variable Frequency Controls
   Part 31 – Definite-Purpose Inverter-Fed Motors
   Part 32 – Synchronous Generators
National Electrical Manufacturers Association – NEMA

The motors manufactured at our factory are designed and manufactured using applicable NEMA Standards as minimum criteria.


This standard provides recommendations for the selection, installation, and use of rotating electric machines in such a manner as to provide for the practical safeguarding of persons and property.


This standard provides a method of estimating sound levels for installed rotating electrical machines.


This standard provides practical information concerning the proper selection and application of polyphase induction and synchronous motors including installation, operation, and maintenance.
The Institute of Electrical and Electronics Engineers – IEEE

The following IEEE Standards may be used in specifying NEMA frame size motors

IEEE 112 – 2004  Test Procedures for Polyphase Induction Motors and Generators

This standard covers instructions for conducting and reporting the more generally applicable and acceptable tests to determine the performance characteristics of polyphase induction motors and generators.

IEEE 85 – 1986  Test Procedure for Airborne Sound Measurements on Rotating

This procedure defines approved methods for conducting tests and reporting results to effect the uniform determination of rotating electric machine sound under steady-state conditions with an accuracy of + 3dB.

IEEE 45 – 2002  Practice for Electric Installations on Shipboard

These Marine Recommendations are to serve as a guide for the equipment of merchant vessels with an electric plant system and electric apparatus for lighting, signaling, communication, power and propulsion. They indicate what is considered good engineering practice with reference to safety of the personnel and of the ship itself as well as reliability and durability of the apparatus.


This test procedure has been prepared to outline useful methods for the evaluation of systems of insulation for random wound stators of rotating electric machines. The purpose of this test procedure is to classify insulation systems in accordance with their temperature limits by test, rather than by chemical composition. The intention is to classify according to recognized A, B, F, and H categories.
The Institute of Electrical and Electronics Engineers – IEEE

IEEE 841 – 2001 IEEE Standard for Chemical Industry Severe Duty TEFC Squirrel Cage Induction Motors Up to and Including 500 HP

The purpose of this standard is to define a specification that deals with mechanical and electrical performance, electrical insulation systems, corrosion protection, and electrical and mechanical testing for severe duty TEFC squirrel cage polyphase induction motors, up to and including 500 HP, for petroleum and chemical industry application. Many of the specified materials and components in this standard stem from experience with severely corrosive atmospheres and the necessity for safe, quiet, reliable, high efficiency motors.


IEEE 344 – 2004 IEEE Recommended Practice for Seismic Qualification of Class 1E Equipment for Nuclear Power Generating Stations

These standards relate to Class 1E safety-related equipment for use in nuclear power generating stations. We do not manufacture motors to these standards.
American Petroleum Institute – API

API

This standard, together with applicable motor data sheets and job specifications, covers the requirements for form-wound squirrel cage induction motors 250 HP and larger for use in petroleum industry services.

NOTE: This standard is written with the intention of being a guideline for preparing specifications by a company for a specific job or project. We cannot build motors to this specification because it requires choices to be made whether certain paragraphs are applicable for the particular job.

API 541 4th Edition 2004

This standard, together with applicable motor data sheets and job specifications, covers the requirements for form-wound squirrel cage induction motors 500 HP and larger for use in petroleum industry services. It covers machines that have one or more of the following:

1. Critical service applications
2. Larger than 3000 HP (2250kW) for speeds 1800 rpm and below
3. 800 HP and larger for 2 pole, enclosed machines, 1250 HP and larger for 2 pole, open machines (WPI or WPII)
4. High inertia loads (in excess of \(Wk^2\) listed in NEMA MG 1)
5. Uses adjustable speed drives as a source of power
6. Is an induction generator
7. Vertical machine rated 500 HP or greater
8. Operates in abnormally hostile environments
API 547 1st Edition 2005

Covers the requirements for form-wound induction motors for use in general-purpose petroleum, chemical and other industrial severe duty applications. These motors:

(a) Are rated 250 hp (185 kW) through 3000 hp (2250 kW) for 4, 6 and 8 pole speeds.

(b) Are rated less than 800 hp (600 kW) for two-pole (3000 or 3600 RPM), motors of totally-enclosed construction.

(c) Are rated less than 1250 hp (930 kW) for two-pole motors of WP-II type enclosures.

(d) Drive centrifugal loads.

(e) Drive loads having inertia values within those listed in NEMA MG 1 Part 20).

(f) Are not induction generators.


API 547 was developed to remove some of the burden, allowing engineers to write slimmer specifications for severe-duty general purpose motors with horsepower ranges below those of API 541 (see above). For critical-duty motors and those with horsepower requirements above the limits of API 547, API 541 remains the standard.

American Petroleum Institute – API
API 610 – 2004

Specifies requirements for centrifugal pumps, including pumps running in reverse as hydraulic power recovery turbines, for use in petroleum, petrochemical and gas industry process services. This standard is applicable to overhung pumps, between-bearings pumps and vertically suspended pumps (see Table 1). Clause 8 provides requirements applicable to specific types of pump. All other clauses of this International Standard are applicable to all pump types. Illustrations are provided of the various specific pump types and the designations assigned to each specific type..
National Electrical Code (N.E.C.)

NFPA 70 (National Fire Protection Association) – 2002 Edition

The purpose of this code is the practical safeguarding of persons and property from hazards arising from the use of electricity.

This code covers the installation of electric conductors, electric equipment, signaling and communications conductors and equipment, and their fiber optic cables and raceways for the following:

1. Public and private premises, including buildings, structures, mobile homes, recreational vehicles, and floating buildings.

2. Yards, lots parking lots, carnivals, and industrial substations.

3. Installations of conductors and equipment that connect to the supply of electricity.

4. Installations used by the electric utility, such as office buildings, warehouses, garages, machine shops, and recreational buildings, that are not an integral part of a generating plant, substation, or control center.
Hazardous Location Classifications

Abstract

In spite of a lot of technical articles written on this subject, the complexities still remain. The main purpose of this paper is to simplify the complexities, the classification of these motors, and make it easier for the user to understand.

Classification

There are three main categories of classification:

1. Division
2. Class
3. Group

Division:  In real sense, it means location or area of the hazard. There are only two types of divisions:

Division 1 – Hazard can occur under normal conditions
Division 2 – Hazard can occur only under abnormal conditions

Local safety authorities decide what are normal and abnormal conditions. Therefore, the first step is to contact local authorities to define the location if it is Division 1 or Division 2.

Class:  Defines the type of hazard. There are three different classes.

Class I – Consists of chemical gases or vapors in the environment, such as gasoline or acetylene.

Class II – Consists of flammable dust in the environment, such as coke dust, grain dust, etc.

Class III – Consists of flammable lint or fibers in the area, such as textile, saw dust, etc.
Hazardous Location Classifications

Groups: Defines the principal chemical gas, vapor or dust present in the environment. The term group comes from the various atmospheric mixtures which have been grouped together on the basis of their hazardous characteristics.

Groups A, B, C, and D are always in the form of gas or vapor. Therefore, these groups can exist only under Class I category.

Groups E, F, and G are always in the form of dust. Therefore, these groups can exist only under Class II category.

Underwriters Laboratories Labeling

Underwriters Laboratories is the only safety agency recognized by the National Electrical Code for the approval of electric motors under hazardous locations.

It defines all the requirements for the manufacturers to make these motors after Division, Class, and Groups are defined by the user.

The following chart should help understanding where U.L. label is required.

U.L. Requirements

<table>
<thead>
<tr>
<th>Division 1</th>
<th>Division 2</th>
<th>Class I</th>
<th>Class II</th>
<th>Class III</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

– Color indicates U.L. label required.
Hazardous Location Classifications

Diagram showing the classification of hazardous locations with UL approval required or not, based on division and class of hazard.
### Substances and Atmospheres Chart

#### Table I. Class I Substances and Atmospheres

<table>
<thead>
<tr>
<th>Substance or Atmosphere</th>
<th>Minimum Ignition Temperature</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Group A</strong></td>
<td></td>
</tr>
<tr>
<td>acetylene</td>
<td>303 °C (581 °F)</td>
</tr>
<tr>
<td><strong>Group B</strong></td>
<td></td>
</tr>
<tr>
<td>butadiene</td>
<td>420 °C (788 °F)</td>
</tr>
<tr>
<td>ethylene oxide</td>
<td>429 °C (804 °F)</td>
</tr>
<tr>
<td><strong>Group C</strong></td>
<td></td>
</tr>
<tr>
<td>acetaldehyde</td>
<td>175 °C (347 °F)</td>
</tr>
<tr>
<td>cyclopropane</td>
<td>500 °C (932°F)</td>
</tr>
<tr>
<td>diethyl ether</td>
<td>160 °C (320 °F)</td>
</tr>
<tr>
<td>ethylene</td>
<td>450 °C (842 °F)</td>
</tr>
<tr>
<td>isoprene</td>
<td>220 °C (428 °F)</td>
</tr>
<tr>
<td>unsymmetrical dimethyl hydrazine (UDMH) 1, 1-dimethyl hydrazine)</td>
<td>249 °C (480 °F)</td>
</tr>
<tr>
<td><strong>Group D</strong></td>
<td></td>
</tr>
<tr>
<td>acetone</td>
<td>465 °C (869 °F)</td>
</tr>
<tr>
<td>acrylonitrile</td>
<td>481 °C (898 °F)</td>
</tr>
<tr>
<td>ammonia</td>
<td>498 °C (928 °F)</td>
</tr>
<tr>
<td>benzene</td>
<td>560 °C (1040 °F)</td>
</tr>
<tr>
<td>butane</td>
<td>405 °C (761 °F)</td>
</tr>
<tr>
<td>1-butane (butyl alcohol)</td>
<td>365 °C (689 °F)</td>
</tr>
<tr>
<td>2-butanol (secondary butyl alcohol)</td>
<td>405 °C (761 °F)</td>
</tr>
<tr>
<td>n-butyl acetate</td>
<td>425 °C (797 °F)</td>
</tr>
<tr>
<td>isobutyl acetate</td>
<td>421 °C (780 °F)</td>
</tr>
<tr>
<td>ethane</td>
<td>515 °C (959 °F)</td>
</tr>
<tr>
<td>ethanol (ethyl alcohol)</td>
<td>365 °C (689 °F)</td>
</tr>
<tr>
<td>ethyl acetate</td>
<td>427 °C (800 °F)</td>
</tr>
<tr>
<td>ethylene dichloride</td>
<td>413 °C (775 °F)</td>
</tr>
<tr>
<td>gasoline</td>
<td>280 °C (536 °F)</td>
</tr>
<tr>
<td>heptanes</td>
<td>215 °C (419 °F)</td>
</tr>
<tr>
<td>hexanes</td>
<td>225 °C (437 °F)</td>
</tr>
<tr>
<td>methane (natural gas)</td>
<td>540 °C (1004 °F)</td>
</tr>
<tr>
<td>methanol (methyl alcohol)</td>
<td>385 °C (725 °F)</td>
</tr>
<tr>
<td>3-methyl-1-butanol (isoamyl alcohol)</td>
<td>350 °C (662 °F)</td>
</tr>
<tr>
<td>methyl ethyl ketone</td>
<td>516 °C (960 °F)</td>
</tr>
<tr>
<td>methyl isobutyl ketone</td>
<td>460 °C (860 °F)</td>
</tr>
<tr>
<td>2-methyl-propanol (isobutyl alcohol)</td>
<td>427 °C (800 °F)</td>
</tr>
<tr>
<td>2-methyl-2-propanol (tertiary butyl alcohol)</td>
<td>480 °C (896 °F)</td>
</tr>
<tr>
<td>octanes</td>
<td>220 °C (428 °F)</td>
</tr>
<tr>
<td>petroleum naptha</td>
<td>288 °C (550 °F)</td>
</tr>
<tr>
<td>1-pentanol (amy alcohol)</td>
<td>300 °C (572 °F)</td>
</tr>
<tr>
<td>propane</td>
<td>450 °C (842 °F)</td>
</tr>
<tr>
<td>1-propanol (propyl alcohol)</td>
<td>440 °C (824 °F)</td>
</tr>
<tr>
<td>2-propanol (isopropyl alcohol)</td>
<td>399 °C (750 °F)</td>
</tr>
<tr>
<td><strong>Group E</strong></td>
<td></td>
</tr>
<tr>
<td>Metallic dusts</td>
<td></td>
</tr>
<tr>
<td>Dusts of aluminum, magnesium, their commercial alloys and other metals of similarly hazardous characteristics.</td>
<td></td>
</tr>
<tr>
<td><strong>Group F</strong></td>
<td></td>
</tr>
<tr>
<td>Electrically conducting non-metallic dusts</td>
<td>Coal dust, pulverized coal, pulverized coke, pulverized charcoal, carbon black and similar substances.</td>
</tr>
<tr>
<td>Electrically non-conducting dusts</td>
<td>Grain dusts, grain product dusts, pulverized sugar, pulverized starch, dried powdered potato, pulverized cocoa, pulverized spices, dried egg and milk powder, wood flour, oilmeal from beans and seeds, dried hay and other products producing combustible dust when dried or handled and other similar substances.</td>
</tr>
<tr>
<td><strong>Group G</strong></td>
<td></td>
</tr>
<tr>
<td>Ignitable Fibers or Flying</td>
<td>Rayon, Cotton</td>
</tr>
<tr>
<td>Sawdust</td>
<td>Sisal</td>
</tr>
<tr>
<td>Henequen</td>
<td>Iistle</td>
</tr>
<tr>
<td>Jute</td>
<td>Hemp</td>
</tr>
<tr>
<td>Tow</td>
<td>Cocoa fiber</td>
</tr>
<tr>
<td>Oakum</td>
<td>Baled waste kapok</td>
</tr>
<tr>
<td>Spanish moss</td>
<td>Excelsior</td>
</tr>
<tr>
<td>(and other materials of similar nature)</td>
<td></td>
</tr>
</tbody>
</table>
Special Construction Features

1. Most are provided with thermal protection.

2. Most are made of cast iron frame.

3. Conduit boxes of the motors going in Division 1 are specially sealed.

4. Class I motors have longer lap joints, tighter fits, and longer flame paths so that if an explosion does occur in the motor, it’s contained in the motor and flames coming out through the joints are cooled enough to be extinguished. They may be bolted by hardened steel bolts.

5. Motors used in atmosphere of less than -25°C require still stronger construction features because of the extra stresses, also because of the increase in the density of the environment. The amount of energy required to cause an explosion is more, but the explosion is of much greater intensity. Standard explosion-proof motors are not useable below -25°C without special UL testing, approval, and marking.

6. Class II motors have bearing dust seals.

7. Non-sparking fan made of aluminum, bronze, or plastic is used to prevent friction sparks in case of any small stones or metal objects getting into the air stream and bouncing off fan blades, and to prevent the build-up of static electrical charge which could generate a spark.
Special Information for User

U.L. does not offer any standards on Division 1 Class 1 Groups A and B.

U.L. does not offer any standards on Division 2 motors.

U.L. does not offer any standards on Class III motors.

U. L. does not offer any standards for motors used below ambient temperatures of -25°C, but will conduct individual tests at whatever low ambient is desired.

Motors rated \(\frac{3}{4}\) HP and less may have internally mounted automatic thermal overload. Caution should be observed when applying these to the machinery as automatic thermal overload resets and starts the motor.

Motors rated 1 HP and more may have thermostats on the windings which are pilot circuit devices only to be connected into the magnetic starter circuit.

Open motors can only be used in Division 2 location.

Operating temperature of space heaters must be considered when non-UL listed motors are applied in Division 2 locations. Any heater temperature below 200°C.

Conclusion

This paper provides the general everyday information. The user should be very careful about the special situations which are not covered by National Electrical Code tables. The main limiting factor is the surface temperature of the motor which should always be below the minimum ignition temperature of the environment. It should also be strong enough to contain any explosion inside.

Recognized UL Component Mark for Canada and the US

This new UL Recognized Component Mark, which became effective April 1, 1998, may be used on components certified by UL to both Canadian and U.S. requirements. Although UL had not originally planned to introduce a combined Recognized Component Mark, the popularity of the Canada/U.S. Listing and Classification Marks among clients with UL certifications for both Canada and the United States has led to the new Mark.
Special Information for User

The latest revisions of the U.L. Standards are primarily additional safety features and in no way affect the safe operation of U.L. labeled motors now in use. The most significant change in the revised Standards is that all motors must bear a marking indicating maximum operating temperature. This change, in effect, further subdivides each of the existing U.L. groups.

The marking to show maximum surface operating temperature must be in either degrees C or F, or by code, indicating the temperature range, i.e., a motor having a maximum surface operating temperature of 165°C may be marked 165°C or 329°F or coded T3B. All temperatures are on the highest temperature obtained in an ambient of 40°C (104°F) under all operating conditions, including overload, single-phasing, and locked-rotor operation. National Electrical Code (2002) Article 500-8(B) lists the preferred markings in part as follows:

<table>
<thead>
<tr>
<th>Maximum Temperature</th>
<th>Temperature Class (T Code)</th>
</tr>
</thead>
<tbody>
<tr>
<td>C°</td>
<td>F°</td>
</tr>
<tr>
<td>450</td>
<td>842</td>
</tr>
<tr>
<td>300</td>
<td>572</td>
</tr>
<tr>
<td>280</td>
<td>536</td>
</tr>
<tr>
<td>260</td>
<td>500</td>
</tr>
<tr>
<td>230</td>
<td>446</td>
</tr>
<tr>
<td>215</td>
<td>419</td>
</tr>
<tr>
<td>200</td>
<td>392</td>
</tr>
<tr>
<td>180</td>
<td>356</td>
</tr>
<tr>
<td>165</td>
<td>329</td>
</tr>
<tr>
<td>160</td>
<td>320</td>
</tr>
<tr>
<td>135</td>
<td>275</td>
</tr>
<tr>
<td>120</td>
<td>248</td>
</tr>
<tr>
<td>100</td>
<td>212</td>
</tr>
<tr>
<td>85</td>
<td>185</td>
</tr>
</tbody>
</table>

Note that it is not possible to build every motor with every temperature code. Temperatures below 160°C are not usually available. Consult factory for specific code availability.
Canadian Standards Association – CSA

Most motors sold and used in Canada require C.S.A. certification. This involves submitting design details and testing of motors. Below is a tabulation of motors which are presently certified to C.S.A. standards. Auxiliary devices such as bearing RTD’s and vibration switches are not included, and are to be submitted to C.S.A. for investigation and acceptance before they can be used on the motor.

I. Motors for Ordinary Location – C.S.A. Certification File No. LR 39020 (Mexico):

<table>
<thead>
<tr>
<th>Type</th>
<th>Principle</th>
<th>Max HP</th>
<th>Insul.</th>
<th>Max Volts</th>
<th>Frames</th>
<th>Phase</th>
<th>Freq.</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>RG</td>
<td>Squirrel Cage</td>
<td>600</td>
<td>B, F</td>
<td>600</td>
<td>140T to 440T &amp; TS</td>
<td>3</td>
<td>50, 60</td>
<td>1</td>
</tr>
<tr>
<td>RGF</td>
<td>Squirrel Cage</td>
<td>600</td>
<td>B, F</td>
<td>600</td>
<td>140T to 440T &amp; T</td>
<td>3</td>
<td>50, 60</td>
<td>1, 2, 4</td>
</tr>
<tr>
<td>RGV</td>
<td>Squirrel Cage</td>
<td>600</td>
<td>B, F</td>
<td>600</td>
<td>140T to 440T &amp; T</td>
<td>3</td>
<td>50, 60</td>
<td>1, 3, 4</td>
</tr>
<tr>
<td>RGZ</td>
<td>Squirrel Cage</td>
<td>300</td>
<td>B, F</td>
<td>600</td>
<td>140T to 440T &amp; TS</td>
<td>3</td>
<td>50, 60</td>
<td>1</td>
</tr>
<tr>
<td>RGZF</td>
<td>Squirrel Cage</td>
<td>300</td>
<td>B, F</td>
<td>600</td>
<td>140T to 440T &amp; T</td>
<td>3</td>
<td>50, 60</td>
<td>1, 3, 4</td>
</tr>
<tr>
<td>RGZV</td>
<td>Squirrel Cage</td>
<td>300</td>
<td>B, F</td>
<td>600</td>
<td>140T to 440T &amp; T</td>
<td>3</td>
<td>50, 60</td>
<td>1, 3, 4</td>
</tr>
<tr>
<td>RGZV-IL</td>
<td>Squirrel Cage</td>
<td>300</td>
<td>B, F</td>
<td>600</td>
<td>213LP(H) to 449LP(H)</td>
<td>3</td>
<td>60</td>
<td>1, 3, 4</td>
</tr>
</tbody>
</table>

Notes: 1. Types RG, RGF, and RGV are drip-proof and Types RGZ, RGZF, RGZV, and RGZV-IL are TEFC motors. Other suffixes may be added to denote specific features such as high efficiency.

2. Horizontal with or without feet.

3. Vertical with or without feet.

4. Suffix letter C, D, or P may be added to frame designation denoting type of flange, and suffix letter Z denoting non-standard shaft extension.

Special Markings: All the above motors are to be marked on the nameplate with the C.S.A. symbol, and code-dated with month and year of manufacture (e.g. “1281” means December 1981). Any warning labels must be bilingual (English-French).

All motors to have C.S.A. accepted ground terminal mounted inside the conduit box.
Canadian Standards Association – CSA

II. Motors for Hazardous Locations (Div 1) – C.S.A. Certification File No. LR 39020 (Mexico)

These motors are for continuous or intermittent duty:

<table>
<thead>
<tr>
<th>Hazardous Location, Class, or Group</th>
<th>Motor Type</th>
<th>Max RPM</th>
<th>Insul.</th>
<th>Max Volts</th>
<th>Frames</th>
<th>Phase</th>
<th>Freq.</th>
</tr>
</thead>
<tbody>
<tr>
<td>I C &amp; D, II E, F &amp; G</td>
<td>RGZZ</td>
<td>3600</td>
<td>B</td>
<td>600</td>
<td>143T to 449T &amp; TS</td>
<td>3</td>
<td>50, 60</td>
</tr>
<tr>
<td>I C &amp; D, II E, F &amp; G</td>
<td>RGZZ</td>
<td>3600</td>
<td>F</td>
<td>600</td>
<td>284T &amp; TS to 449T &amp; TS</td>
<td>3</td>
<td>50, 60</td>
</tr>
<tr>
<td>I D</td>
<td>RGZZV-IL</td>
<td>3600</td>
<td>B</td>
<td>600</td>
<td>213LP &amp; LPH to 449LP &amp; LPH</td>
<td>3</td>
<td>60</td>
</tr>
</tbody>
</table>

Note: Designation RG is for basic AC motor type. Modifiers: ZZ (explosion-proof fan cooled), V (vertical with or without feet), F (horizontal flanged with or without feet), W (low noise), T (NEMA Design C: high starting torque, low slip), H (NEMA Design D; high torque, high slip), -SD (with corrosion resistant modifications for severe duty), -IL (motor for in-line pumps). Flanged motors, vertical or horizontal, may have C, D, or P flange.

**Special Marking**

C.S.A symbol on motor main nameplate and on UL label. Date code for year and month of manufacture (e.g. “1281” means December 1981). Any warning labels must be bilingual (English-French).

All motors to have C.S.A. accepted ground terminal mounted inside the conduit box.

Requirements for motors not included in the above two tables should be discussed with the factory. Where good business opportunities exist, special C.S.A. acceptance on a case basis can normally be obtained within a few months after the application is submitted to C.S.A. The investigation usually requires C.S.A. inspection of the motor, test data, and, sometimes, C.S.A. testing of motor components.
Certificate of Compliance

Certificate: 1740199 (LR 39020)  
Project: 1740199  
Issued to: Siemens, Sociedad Anonima de  
Capital Variable Siemens SA de CV  
Fabrica Guadalajara  
Camino a la Tijera 1  
Km 3.5 Carretera Guadalajara-Morelia  
Tlajomulco de Zuñiga, Jalisco 45640  
Mexico  
Attention: Mr. L. C. Verduzo

The products listed below are eligible to bear the CSA Mark shown with adjacent indicators 'C' and 'US'

Issued by: Babu Patel P. Eng.

Authorized by: Gabriel Lippa, C.E.T., Product Group Manager

PRODUCTS  
CLASS 4211 01 - MOTORS AND GENERATORS  
CLASS 4211 81 - MOTORS AND GENERATORS - Certified to US Standards

Three phase squirrel cage induction motors Type GP10, GP10-A, GP100, GP100-A, SD10, SD100 and SD100 IEEE341, 20 HP Max, 3600 RPM Max, 600V max, 50/60 Hz., TEFC, Class F or H, 40C Ambient, Continuous Duty, Service Factor 1.15, NEMA Frame 140T - 250T.

Notes:

The 'C' and 'US' indicators adjacent to the CSA Mark signify that the product has been evaluated to the applicable CSA and ANSI/UL Standards, for use in Canada and the U.S., respectively. This 'US' indicator includes products eligible to bear the 'NRTL' indicator. NRTL, i.e. National Recognized Testing Laboratory, is a designation granted by the U.S. Occupational Safety and Health Administration (OSHA) to laboratories which have been recognized to perform certification to U.S. Standards.
Canadian Standards Association – CSA

Certificate: 1740199 (LR 39020)  
Master Contract: 153422

Project: 1740199  
Date Issued: 2006/02/17

(a) Additional letters and number are added to motor part number representing electrical and mechanical variation.

(b) Zeros of frame designation may be replaced by numbers representing different size.

(c) Motors are horizontal, vertical, C, D or P flange.

**APPLICABLE REQUIREMENTS**

CAN/CSA-C22.2 No. 100 - Motors and Generators

UL Std No. 1004 - Electric Motors
Addresses of Standard Agencies

To obtain catalogs or purchase standards, contact the appropriate organization below:

**N.E.M.A.**
1300 North 17th Street
Suite 1847
Rosslyn, Virginia 22209
Voice line: (703) 841-3200

**U.L.**
333 Pfingsten Road
Northbrook, Illinois 60062-2096
Voice line: (847) 272-8800

**IEEE**
445 Hoes Lane
P.O. Box 1331
Piscataway, New Jersey 08855-1331
Voice line: (800) 678-4333

**C.S.A.**
178 Rexdale Boulevard
Rexdale (Toronto)
Ontario, Canada
M9W 1R3

**A.P.I.**
2101 “L” Street, Northwest
Washington D.C. 20037
Voice line: (202) 682-8000

**N.E.C.**
National Fire Protection Association
1 Batterymarch Park
P.O. Box 9146
Quincy, Massachusetts 02269-9703
Voice line: (800) 344-3555
Bevollmächtigter: Siemens AG
Authorized representative
Automation and Drives
Standard Drives

Anschrift: 91056 Erlangen
Address: Deutschland

Hersteller: SIEMENS, S.A. DE C.V.
Manufacturer: Fabrica Guadalajara, Mexico

Produktbezeichnung: Drehstrom-Asynchronmotor mit Käfigläufer /
Product description: Three-phase induction motor with squirrel-cage
Typen / Types: RG... RGZ... HSGZ... RGK... GP... SD...
1LA... 1RA... 1LE... 1PC...
Achshöhe / Shaft Height: 2.62 – 11.0 Inches
Bemessungsleistungen bis / Rated output up to: 500 HP

Einphasenmotor mit Käfigläufer /
Single-phase motor with squirrel-cage
Typen / Types: 1LF... 1RF...
Achshöhe / Shaft Height: 2.62 – 5.25 Inches
Bemessungsleistungen bis / Rated output up to: 10 HP

Das bezeichnete Produkt stimmt mit den Vorschriften folgender Europäischer Richtlinien überein:

73/23/EWG Richtlinie des Rates zur Angleichung der Rechtsvorschriften der Mitgliedstaaten betreffend
elektrischer Betriebsmittel zur Verwendung innerhalb bestimmter Spannungsgrenzen, geändert
durch RL 93/68/EWG des Rates

Die Übereinstimmung mit den Vorschriften dieser Richtlinien wird nachgewiesen durch die vollständige
Einhaltung folgender Normen:

EN / IEC 60204-1 EN / IEC 60034

Das bezeichnete Produkt ist zum Einbau in eine andere Maschine bestimmt. Die Inbetriebnahme ist solange
untersagt, bis die Konformität des Endproduktes mit der Richtlinie 98/37/EG festgestellt ist.

Erstausgabe / First edition: 21.10.99
Bad Neustadt, den 17.02.2006

Thomas Werbinck
Head of Research and Development Motors

Hans-Jürgen Friese
Director Quality Management

Diese Erklärung ist keine Zusicherung von Eigenschaften im Sinne der Produkthaftung.
Die Sicherheitshinweise der Produktdokumentation sind zu beachten.
EC declaration of conformity

The named product is in conformity with the requirements of the following European Directive:


Conformity with the requirements of these Directives is testified by complete adherence to the following standards:

The named product is intended for fitting in another machine. Commissioning is prohibited until such time as the end product has been proved to conform to the provisions of Directive 98/37/EC.

This Declaration does not give assurance of properties within the meaning of product liability. The safety instructions provided in the product documentation must be observed.

Déclaration de conformité CE

Le produit sus-mentionné est conforme aux prescriptions des Directives Européennes suivantes :


La conformité du produit sus-mentionné aux prescriptions de ces directives est démontrée par sa conformité intégrale aux normes suivantes :

Le produit sus-mentionné est destiné exclusivement à l'incorporation dans une autre machine. La mise en service est proscrite tant que la conformité du produit final avec la Directive 98/37/CE n'a pas été constatée.

Cette déclaration n'est pas une assurance de qualité dans le sens de la responsabilité du produit. Les indications de sécurité de la documentation du produit sont à suivre.

Declaración de conformidad CE

El producto designado cumple con las prescripciones de las siguientes directivas europeas:

73/23/CEE  Directiva del Consejo para la armonización de legislaciones de los estados miembros relativas a materiales eléctricos a ser utilizados dentro de márgenes de tensión definidos, modificada por la Directiva 93/68/CEE.

La conformidad con las prescripciones de estas Directivas queda justificada por haberse cumplido totalmente las siguientes normas:

El producto designado está destinado a la incorporación en otra máquina. No se permite su puesta en servicio hasta tanto no se haya comprobado que el producto final cumple con la Directiva 98/37/CE.

Esta declaración no garantiza características según la responsabilidad sobre productos. Han de observarse las indicaciones de seguridad en la documentación del producto.

Dichiarazione di conformità CE

Il prodotto indicato soddisfa le norme delle seguenti Direttive CEE:

73/23/CEE  Direttiva del consiglio per l'armonizzazione delle norme giuridiche degli Stati membri relative a caratteristiche del materiale elettrico destinato ad essere adoperato entro taluni limiti di tensione, modificata dalla Direttiva 93/68/CEE del Consiglio.

La conformità al requisiti delle presenti direttive viene provata dal completo rispetto delle seguenti norme:

Il prodotto indicato è destinato ad essere integrato in un'altra macchina. Ai sensi della dichiarazione del costruttore la messa in servizio non è consentita fino a quando non è stabilita la conformità del prodotto finale alla Direttiva 98/37/CE.

La presente dichiarazione non assicura le caratteristiche del prodotto ai sensi della legge per la responsabilità del produttore. Osservare le avvertenze relative alla sicurezza contenute nella documentazione relativa al prodotto.

EC-konformitetsförklaring

Den märkta produkten överensstämmer med föreskrifterna i följande europeiska direktiv:


Överensstämmelse med föreskrifterna i detta direktiv sker genom det absoluta respektierandet av följande normer:

Den märkta produkten är agnad att monteras i en annan maskin. Ideltagandet är ej tillåtet innan ändprodukten konformitet med direktiv 98/37/EC är fastställt

Denne declaration får ikke uppfattes som försikran om egenskaper enligt krav i produktskrivning. Lekta säkerhetsanvisningar i den medlevererade produktdocumentationen.