IHP Motor Rule 2014 Brief

Effective Date: July 28, 2014

The Department of Energy's Office of Energy Efficiency and Renewable Energy has released (May 29, 2014) revised Energy Conservation Standards for Commercial and Industrial Electric Motors.

This latest rule amends the original The Energy Policy and Conservation Act of 1975 (EPCA), described in CFR10 part 431 as it pertains to commercial and industrial electric motors. The rule is effective July 28, 2014, and requires compliance June 1, 2016.

This revision was accomplished through the traditional DOE rule making process which evaluates seven essential facets to assure all parties are heard and projected energy savings are substantiated. Product utility is one of the seven key fundamentals used in the development of this rule. NEMA® and other stakeholders made it clear to DOE and their contractors that any revisions to the current rule must consider the impact on OEMs and end users of polyphase motors. The coalition was concerned that any revision that increased the efficiency levels would lead to changes to either the mechanical or electrical performance of the subject motors. The members of the NEMA motor generator section worked in collaboration with ACEEE, the Appliance Standards Awareness Project (ASAP), and leading utility and energy advocates to provide DOE with a comprehensive proposal that maintains the motor's performance at NEMA 12-12 efficiency levels, thus allowing huge energy saving without jeopardizing the OEM and end user's ability to apply or retrofit the additional covered products. This amendment will have a significant effect on Commercial and Industrial products as it expands the list of covered product to encompass virtually all polyphase 1-500 HP motors sold in the USA.

The amended rule has three important elements that need to be clearly understood.

1. Motor types or equipment classes that will be added to covered product scope

2. Levels of performance required for these products

3. Timing of implementation

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The amended rule will continue to use the motor test methods currently in effect. However, the DOE did publish a revision to the test rule in January of 2014 in which DOE describes several additional steps or configurations that manufacturers will need to be followed in the testing of motors such as partial or vertical construction to assure accuracy. The table I.1 from the amended rule shows the product range and the performance level. Groups one and two will be required to meet NEMA table 12-12 nominal efficiency levels. Group three (fire pumps) will remain at NEMA 12-11 nominal efficiency levels.

Table I.1
Energy Conservation Standards for Electric Motors (Compliance June 1, 2016)

Equipment Class Group	Electric Motor Design Type	Horsepower Rating	Pole Configuration	Enclosure
1	NEMA Design A&B*	1-500	2, 4, 6, 8	Open
				Enclosed
2	NEMA Design C*	1-200	4, 6, 8	Open
				Enclosed
3	Fire Pump*	1-500	2, 4, 6, 8	Open
				Enclosed

The amended rule will be implemented June 1st 2016, 24 months from the publication date in the federal register. As with all DOE rules, the added equipment classes (see table IV.3 on back) will be required to meet the revised efficiency levels based on the date of manufacture. Nidec Motor Corporation's OEMs, distributors and end users should not see any stranded inventory as a result of this rule. In past regulatory implementations our OEM customers began revising their bills of material ahead of the rules implementation date allowing ample time to discuss inventory transition and schedules. The effects of this rule will be a significant increase in the number of motors covered. NEMA estimates that the number of motors covered will more than double to more than 5 million units per year sold in the USA. The Department of Energy estimates the new standard will save consumers up to nearly $16 billion and prevent 96 million metric tons of CO2 through 2030.

Covered products are described in table IV.2 from the rule with a nine point definition;

Table IV.2
Characteristics of Motors Regulated Under Expanded Scope of Coverage

Motor Characteristic
Is a single-speed, induction motor,
Is rated for continuous duty (MG 1) operation or for duty type S1 (IEC),
Contains a squirrel-cage (MG 1) or cage (IEC) rotor,
Operates on polyphase alternating current 60-hertz sinusoidal power,
Is rated for 600 volts or less,
Is built with a 2-, 4-, 6-, or 8-pole configuration,
Is built in a three-digit or four-digit NEMA® frame size (or IEC metric equivalent), including those designs between two consecutive NEMA frame sizes (or IEC metric equivalent), or an enclosed 56 NEMA frame size (or IEC metric equivalent),
Produces at least 1 horsepower (0.746 kW) but not greater than 500 horsepower (373 kW) and
Meets all of the performance requirements of a NEMA Design A, B, or C motor or of an IEC Design N or H electric motor.

This approach has been used with other federally regulated products in the past. This definition is intentionally very broad to add all but a very small number of unique motor types. Motors specifically listed as exclusions are in table IV.4 below. (“inverter-only” refers to a full NEMA part 31 motor) Motors capable of operating on an inverter are currently covered and will remain so under the amended regulation.

Table IV.4
Equipment Specifically Excluded from Coverage

Electric Motor Type
Air-over electric motors
Component sets of an electric motor
Liquid-cooled electric motors
Submersible electric motors
Inverter-only electric motors

Table IV.3
List of motors covered in the rule

NEMA Design A from 201 to 500 horsepower	Electric motors with non-standard endshields or flanges
Electric motors with moisture resistant windings	Electric motors with non-standard bases
Electric motors with sealed windings	Electric motors with special shafts
Partial electric motors	Vertical hollow-shaft electric motors
Totally enclosed non-ventilated (TENV) electric motors	Electric motors with sleeve bearings
Immersible electric motors	Electric motors with thrust bearings
Brake electric motors	Electric motors with encapsulated windings
Electric motors with separately powered blowers	

Table IV.3 provides add additional description of covered product that the OEM, distributor or end user can use to determine whether or not a motor type is included. Note that gear motors are included under the partial motors class as well as footless and 56 frame motors (not covered by the current small motor rule) are included. By including these added equipment classes it is believed enforcement in the market place will be less complicated thus allowing federal agents to better identify non-compliant motors and pursue offenders.

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