Motors | Automation | Energy | Transmission & Distribution | Coatings

Global MEPS Guide for Low Voltage Motors

Understanding MEPS

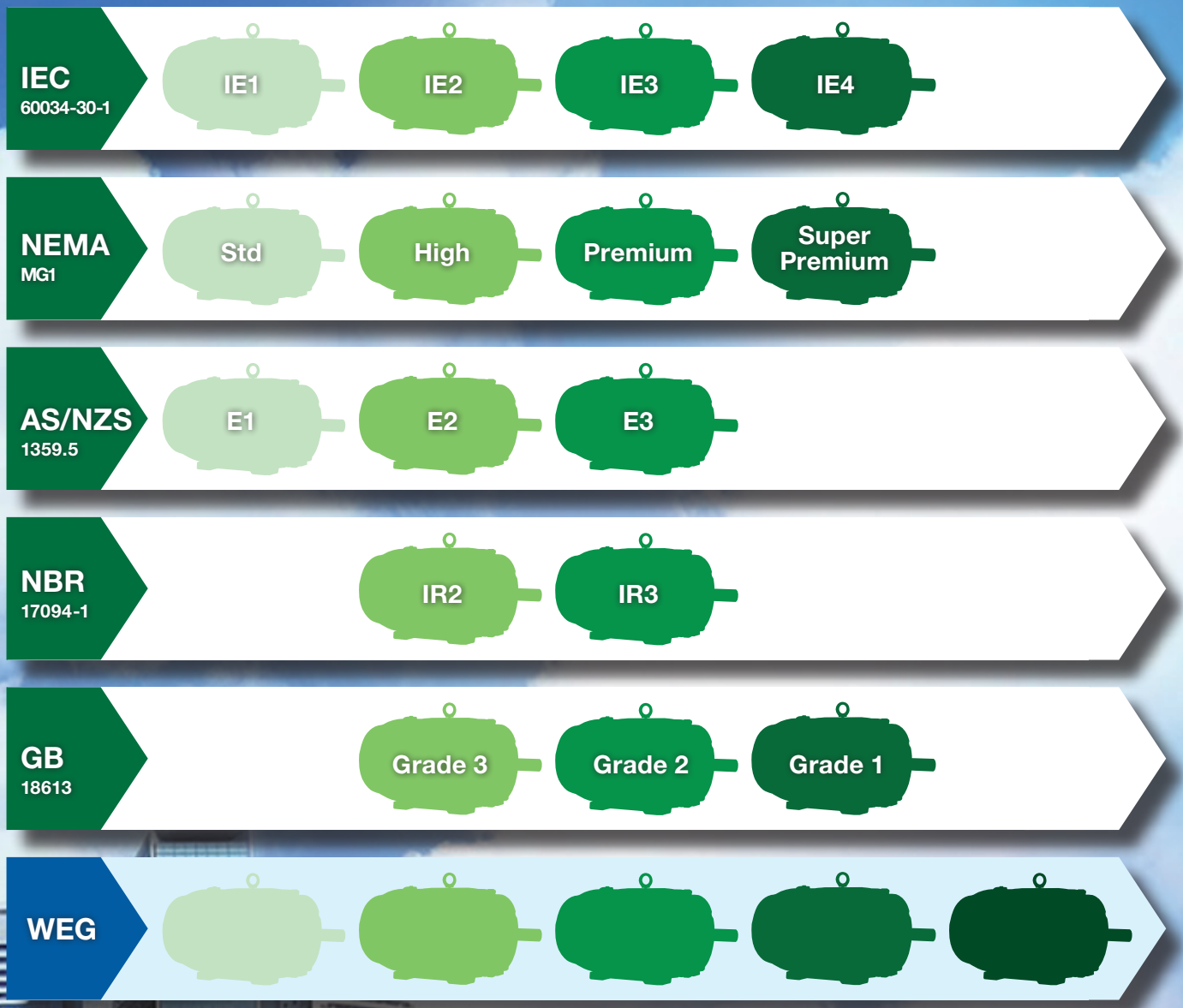
The increasing demand for electrical energy to sustain global development requires consistent heavy investments in power supply generation. However, in addition to complex medium and long term planning, these investments rely on natural resources, which are becoming depleted due to constant pressures upon the environment. The best strategy, therefore, to maintain energy supply in the short term is to avoid wastage and increase energy efficiency. Electric motors play a major role in this strategy; since around **40% of global energy demand is estimated to be related to electric motor applications.**

As a consequence of this need to reduce energy consumption and carbon dioxide emissions, many Governments worldwide have established local Regulations, also known as **MEPS (Minimum Energy Performance Standards)** to numerous types of equipment, including electric motors.

Whilst the specific requirements of these MEPS differ slightly between Countries, the implementation of IEC standards 60034-2-1:2014 (methods for determining losses and efficiencies) and 60034-30-1:2014 (definition of efficiency classes), means that the definition, measurement and publication of the efficiency data is consistent amongst motor manufacturers and therefore easier for the correct motors to be selected.

WEG fully understands the requirements of these Global regulations, and offers today one of the most comprehensive ranges of electric motors complying with these minimum efficiency levels. Furthermore, as a forward thinking Company whose philosophy is to provide its Customers with products which offer optimum performance, energy savings, fast return on investment and sustainability, **WEG continues to focus its efforts in the research and development of electric motors with efficiency levels exceeding those defined in currently published International standards.**

Efficiency Grades



Mandatory Efficiency Regulations Worldwide Overwiew

Legend

Australia, New Zealand & Fiji

GEMS Act of 2012
AS/NZS 1359.5 : 2004

Applicable to:
- Ratings from 0.73 to 185kW
- Motors with 2, 4, 6 and 8 poles
- Frequency: 50Hz
- Voltage up to 1100V

Not applicable to:
- 2 speed motors
- Dedicated VFD design (not suitable for DOL)
- Intermittent / short duty cycles
- Integrated design with driven machine (in exception of TEAO that is included)
- Motors designed to operate wholly immersed in a liquid
- Torque motors
- Motors for re-export

Requirements
- Efficiency level minimum E2 or E3 as per AS/NZS 1359.5
- Efficiency level shall be detailed on motor nameplate
- Motor design must be registered

Brazil

Interministerial Decree nº 553/2005
NBR 17094-1:2013

Applicable to:
- Motors with 2, 4 poles up to 250 HP
- Motors with 6 poles up to 200 HP
- Motors with 8 poles up to 150 HP
- Frequency: 60 Hz (or 50 Hz operating at 60 Hz)
- Voltage up to 1000 V
- Closed and opened enclosures
- Duty cycle S1 or S3 (ED higher or equal to 80%)
- Starting torque as per design N, H, NY or HY (or NEMA equivalent)

Not applicable to:
- Dedicated VFD design (not suitable for DOL)
- Explosion proof (Ex d / Ex de)
- Increased safety (Exe)
- Water cooled motors
- Motors designed to operate wholly immersed in a liquid

Note: Planned shifts for three-phase motors: IR2 to IR3 for 0,16 up to 500 HP in September, 2019.

Requirements
- Motors without this marking will not be allowed through Brazilian customs.

Chile

NCh 3086 of 2008
IEC60034-30-1

Applicable to:
- Ratings from 0.75 to 7,5 kW
- Motors with 2, 4 and 6 poles
- Frequency: 50 Hz
- Voltage up to 690 V

Not applicable to:
- Brake Motors
- Dedicated VFD design (not for DOL)

Note: Planned shifts for three-phase motors: IE1 to IE2 in February, 2018.

Requirements
Motors held in stock by distributors must be certified for the Energy label according PE nº 7/01/2.

China

GB 18613-2012

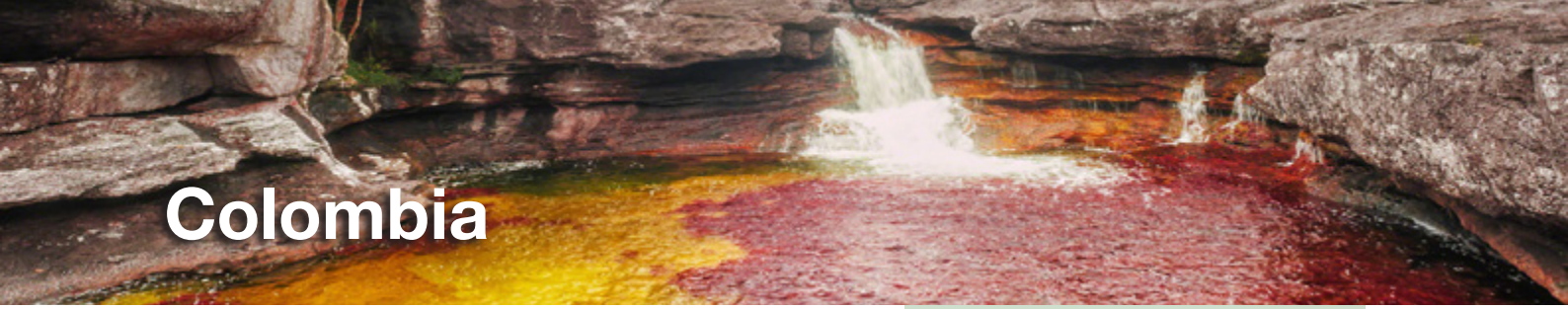
Applicable to:
- Ratings from 0.75 to 375 kW
- Motors with 2, 4 and 6 poles
- Frequency: 50 or 50/60 Hz (operation in 50Hz)
- Aluminum or cast iron frames
- Voltage up to 1000 V
- Operation up to 1000 m
- Safe and Hazardous Area
- Torque design N
- TEFC motors
- Ambient temperature: -20 °C up to 40 °C
- Increased safety motors (Exe)

Not applicable to:
- Motors completely integrated into a product
- Smoke extraction motors and motors for textile industry
- Conical rotor motors for electric hoist and construction machinery
- Motors with electro-magnetic braking inside
- Motors with a duty type other than S1 or S3 with a rated cyclic duration factor of 80% or higher
- Wound-rotor induction motors
- Two/Multiple winding motors

Requirements
- Motors without this label will not be allowed through Chinese customs.

Nameplate shall record:
- Name of manufacturer
- The criteria: GB 18613-2012
- Efficiency values for 100% load

**The recommended efficiency level for motors from 7.5 to 375 kW is Grade 2.*



Colombia

Resolución nº 4 1012:2015

Applicable to:

Single Phase motors:

- Ratings from 0.18 to 1,5 kW
- Motors with 2, 4 and 6 poles
- Frequency: 60 Hz
- Voltage up to 240 V
- Enclosure ODP and TEFC

Three Phase motors:

- Ratings from 0.18 to 373 kW
- Motors with 2, 4, 6 and 8 poles
- Frequency: 60 Hz
- Voltage up to 600 V
- Enclosure ODP and TEFC

Note: Planned shifts for three-phase motors: IE2 in September 2018, IE3 for 7,5-373 kW in September 2020 and IE3 for 0,75-373 kW in September 2021.

Requirements

- Motors without this label will not be allowed through Colombian customs

Europe & Switzerland

EC 640/2009 & EU 4/2014 IEC 60034-30-1

SR 730.01 IEC 60034-30-1

Applicable to:

- Ratings from 0.75 to 375 kW
- Motors with 2, 4 and 6 poles
- Frequency: 50 and 50/60 Hz
- Voltage up to 1000 V
- Closed and open enclosures

Not applicable to:

- 2 speed motors
- Intermittent duty
- Motors wholly immersed in a liquid
- Motors completely integrated into a product
- Altitude higher than 4000 masl
- Ambient temperature below -30 °C or above 60 °C
- Motors specified to operate exclusively above 400 °C
- Motors for explosive atmospheres
- Brake motors

Requirements

Nameplate shall detail:

- IE code (IE3)
- Efficiency values for 50, 75 and 100% load (not mandatory for small motors)
- CE mark
- IE2 motors for 0,75 up to 375 kW fed by VFD are permitted but must be labelled for exclusive VFD operation

Japan

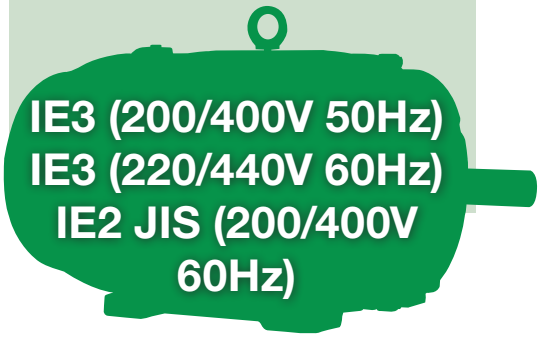
JIS C 4213:2014

Applicable to:
- Ratings from 0.75 to 375 kW
- Motors with 2, 4 and 6 poles
- 200/400 V (50 or 60 Hz)
- 220/440 V (60 Hz)

Not applicable to:
- Explosion proof motors;
- Delta-star starting;
- Marine motors;
- Motors wholly immersed in a liquid;
- High-slip motors;
- Ambient temperature below -20 °C
- Dedicated VFD design (not suitable for DOL) and with Forced ventilation.

Requirements

Importer must provide a self declaration for Efficiency level



Saudi Arabia

SASO IEC 60034-30:2013

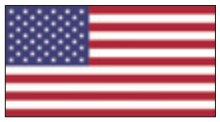
Applicable to:
- Ratings from 0.75 to 375 kW
- Motors with 2, 4 and 6 poles
- Frequency: 60 Hz
- Voltage up to 1000 V
- Duty cycle S1 or S3 (ED higher or equal to 80%)

Not applicable to:
- Motors solely for converter operation per IEC 60034-25
- 2-speed motors
- Motors completely integrated into a product which cannot be independently tested
- Brake motors, Gear Motors & Wound Rotor Motors;
- Motors specifically designed to operate:
  - In maximum operating temperatures above 400 °C
  - In potentially explosive atmospheres (e.g. explosion-proof)
  - Wholly immersed in a liquid
  - Torque motors (corresponding to IEC design H, e.g. gate motors & crane motors)
  - With cooling from external equipment (e.g. air over motors, or liquid cooling)
  - In an enclosed container and part of an integrated system (e.g. canned motor)

Requirements

Nameplate shall detail:
- IE code IE3;
- Efficiency values at 100% load
- Motors without a SASO Certification of Conformity (CoC) will not be allowed through KSA customs

North America



EISA 2014
NEMA MG-1
DOE 10 CFR Part 431

Applicable to:

- Ratings from 1 to 500 HP (2, 4, 6 and 8 poles)
- Voltages up to 600 V
- Three-phase
- Frequency: 60 Hz
- Frames 143 and above (or IEC equivalent)
- Hazardous Location
- NEMA Design A, B or C or IEC Design N or H

Applicable only in US:

- 56 frames (enclosed)
- Pump motors
- Footless motors
- Motors with non-standard base or mounting feet
- Vertical motors
- Motors with special shafts and flanges (including JM/JP)
- Brake motors
- Gear motors (if the motor can be removed from the gear)
- Partial motors (except stator-rotor sets)

Note: Fire pump motors from 1 to 500HP, 2 to 8 poles must meet High Efficiency level.

Not applicable to:

- Dedicated VFD design (not suitable for DOL)
- Submersible motors (IP68)
- Multispeed motors
- Design D
- TEAO or ODPAO
- Intermittent duty motors (S2-S8)
- Stator-rotor sets
- Water cooled motors
- Two digit frames (42 and 48)
- 56 frame ODP

DOE 10 CFR Part 431
Small Electric Motors

Applicable to:

- Ratings from 1/4 to 3 HP
- Motors with 2, 4 and 6 poles
- ODP
- Three or Single Phase (only for CSCR and CSIR)
- NEMA 2-digit frame or IEC equivalent

Not applicable to:

- Definite purpose motors as defined by NEMA MG-1 Part 18
- Non-standard mounting
- Multi-speed motors
- Enclosed motors (Enclosed three-phase 56 frame Integral Horsepower motors covered under EISA, as of June 2016)

EEA
C390-10

NOM-016-ENER-2010

Requirements

- Efficiency level shall be as per NEMA MG1 NEMA Premium ®
- Efficiency level shall be detailed on motor nameplate
- Motor shall be registered at Department of Energy (DOE)
- DOE registration number shall be printed on nameplate (WEG: CC029A)

Penalties for violations: $110 per violation per day

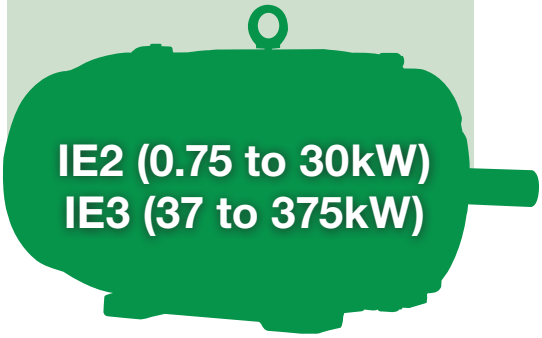
South Korea

MKE-2015-28
KS C IEC60034

Applicable to:
- Ratings from 0.75 to 200 kW (2, 4 ,6 and 8 poles)
- Ratings from 200 to 375 kW (2 and 4 poles)
- Frequency: 60 Hz
- Voltage up to 600 V
- Closed and open enclosures
- Inverter-driven motor with continuous operating (fan, blower and pump)

Not applicable to:
- TEAO and TENV designs
- Duty type S2
- Motors wholly immersed in a liquid
- Design C and D
- Multi-speed motors
- Thrust or sleeve bearing

Requirements
- Motors without this label will not be allowed through Korean customs.



Taiwan

CNS 14400

Applicable to:
- Ratings from 0.75 to 200 kW
- Motors with 2, 4, 6 and 8 poles
- Frequency: 60 Hz
- Voltage up to 690 V

Not applicable to:
- Motors wholly immersed in a liquid
- Motors completely integrated into a product
- Dedicated VFD design (not for DOL)
- Multi-speed motors

Turkey

SMG-2012/2
IEC 60034-30-1

Applicable to:
- Ratings from 0.75 to 375 kW
- Motors with 2, 4 and 6 poles
- Frequency: 50 or 50/60 Hz
- Voltage up to 1000 V
- Closed and open enclosures

Not applicable to:
- 2 speed motors
- Intermittent duty
- Motors wholly immersed in a liquid
- Motors completely integrated into a product
- Altitude higher than 1000 masl
- Ambient temperature out below -15 °C or above 40 °C
- Motors for explosive atmospheres
- Brake motors
- Motors specified to operate exclusively above 400 °C

Requirements
Nameplate shall detail:
- IE code (IE3)
- Efficiency values for 50, 75 and 100% load (not mandatory for small motors)
- CE mark
- IE2 motors for 0,75 up to 375 kW fed by VFD are permitted but must be labelled for exclusive VFD operation

Índia

IS 12615:2011

Applicable to:
- Frames 71 up to 315L
- Motors with 2, 4 and 6 poles
- Frequency: 50 Hz
- Voltage up to 1000 V
- Duty cycle S1 or S3 (ED higher or equal to 80%)
- Ambient temperature up to 40 ºC
- Protection IP44 and above
- Cooling IC411 (TEFC).

Not applicable to:
- Dedicated VFD design (not for DOL)
- Motors completely integrated into a product

Three-phase induction electric motors that are not within the scope of IS 12615: 2011 can continue to be sold and installed in India normally.

Requisitos
- Minimum efficiency level according IS 12615:2011(IE2)
- Motor must be certified by an Indian Certification Body
- Motor must be identified with the Standard ISI Mark

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