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 regional standards such as ABNT, IEC, MG-1, which define the efficiency levels and test methods to determine these efficiencies, allow a standardization of the definition, measurement and publication format for efficiency data amongst motor manufacturers, simplifying the correct motors' selection.

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.
## Predicted Changes

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</table>
SOUTH AMERICA

Argentina
Brazil
Chile
Colombia
Ecuador
Peru
ARGENTINA

Argentine Disposal 230/2015
IRAM 62409:2014
IRAM 62405:2012

Applicable to:
- Output from 0,12 to 7,5 kW (Single-Phase)
  0,75 to 30 kW (Three-Phase)
- Motors with 2, 4 and 6 poles
- Service duty: S1
- Degree of protection: IP2X or higher
- Motors TEFC (IC411)
- Frequency: 50 Hz or 50/60 Hz (for operation in 50Hz)
- Voltage: 220 V (Single-Phase) / 380 V (Three-Phase) *

Not applicable to:
- Multispeed motors
- Dedicated VFD design (not suitable for DOL)
- Integrated design with driven machine
- Explosion proof (Ex ec, Ex db, Ex eb, Ex tc, Ex tb)
- Parts and pieces
- Motors for specific applications: Chainsaw, Fuel pumps, Roller Table, Submersible pumps, WMagnet, WQuattro

Requirements
- Minimum efficiency level regulation does not set a minimum efficiency level for motors.
- Motors without IRAM ID are not allowed.

* Multi-voltage motors that have 220 V (single-phase) or 380 V (three-phase) as one of the operating voltages are covered by scope.
### Requirements

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

### BRAZIL

<table>
<thead>
<tr>
<th>Regulation</th>
<th>Interministerial Decree nº 553/2005</th>
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<tr>
<td>Portaria INMETRO nº 488 de 2010</td>
<td>ABNT NBR 17094-1</td>
<td>ABNT NBR 17094-1</td>
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<th>Power supply system</th>
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<th>Minimum energy performance</th>
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<tr>
<td>Minimum energy performance when is able to operate with inverter frequency</td>
<td>IR3</td>
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</table>

<table>
<thead>
<tr>
<th>Output (kW)</th>
<th>1 to 250 cv (2 Polos)</th>
<th>1 to 250 cv (4 Polos)</th>
<th>1 to 200 cv (6 Polos)</th>
<th>1 to 150 cv (8 Polos)</th>
<th>0,12 up to 370 kW (0,16 up to 500 cv)</th>
</tr>
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</table>

<table>
<thead>
<tr>
<th>Number of poles</th>
<th>2 / 4 / 6 / 8</th>
</tr>
</thead>
<tbody>
<tr>
<td>Voltage (V)</td>
<td>Up to 1000 V</td>
</tr>
<tr>
<td>Frequency (Hz)</td>
<td>60 Hz or 60/50 Hz</td>
</tr>
<tr>
<td>Service Duty</td>
<td>S1 or S3 ≥ 80%</td>
</tr>
<tr>
<td>Cooling method</td>
<td>TEFC, ODP, TEAO</td>
</tr>
<tr>
<td>Degree of protection</td>
<td>IP 00 to IP 66</td>
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<tr>
<td>Hazardous area</td>
<td>Safe Area / Ex ec / Ex t</td>
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<tr>
<td>Altitude</td>
<td>-</td>
</tr>
<tr>
<td>Ambient temperature</td>
<td>-</td>
</tr>
<tr>
<td>Required documentation</td>
<td>Register</td>
</tr>
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</table>

Not applicable to:
- Dedicated VFD design (not suitable for DOL)
- Explosion proof (Ex db / Ex db eb)
- Increased safety (Ex eb)
- Water cooled motors
- Motors designed to operate wholly immersed in a liquid
NCh 3086 of 2008
IEC60034-30-1

Applicable to:
- Output 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)

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

IE2
**COLOMBIA**

<table>
<thead>
<tr>
<th>Requirement</th>
<th>NEW 2020</th>
<th>NEW 2021</th>
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<tr>
<td>Regulation</td>
<td>RETIQ 2015</td>
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<td>Standard</td>
<td>Resolution nº 4 1012:2015</td>
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<tr>
<td>Power supply system</td>
<td>Three-Phase</td>
<td>Single-Phase</td>
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<tr>
<td>Minimum energy performance</td>
<td>IE2</td>
<td>IE1</td>
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<tr>
<td>Minimum energy performance when is able to operate with inverter frequency</td>
<td>IE2</td>
<td>Not aplicable</td>
</tr>
<tr>
<td>Output (kW)</td>
<td>0,18 to 373 kW</td>
<td>0,18 to 1,5 kW</td>
</tr>
<tr>
<td>Number of poles</td>
<td>2 / 4 / 6 / 8</td>
<td>2 / 4 / 6</td>
</tr>
<tr>
<td>Voltage (V)</td>
<td>Up to 600 V</td>
<td>Up to 240 V</td>
</tr>
<tr>
<td>Frequency (Hz)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Service Duty</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cooling method</td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Required documentation</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Note:** Planned shifts for three-phase motors: 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.
ECUADOR

RTE INEN 145
IEC60034-30-1 / IEC 60034-30-1 / IEC 60034-2-1

Aplicable to:

*Single-Phase Motors:*
- Output from 0,18 to 1,5 kW
- Motors with 2, 4 and 6 poles
- Frequency: 60 Hz
- Voltage up to 120 V
- Closed and open enclosures

*Three-Phase Motors:*
- Output from 0,746 to 373 kW
- Motors with 2, 4, 6 and 8 poles
- Frequency: 60 Hz
- Voltage up to 208 V
- Closed and open enclosures
PERU

Decreto Supremo N° 009-2017-EM

Aplicable to:

Three-Phase Motors:
- Output from 0.75 to 375 kW
- Motors with 2, 4 and 6 poles
- Frequency: 60 Hz
- Voltage up to 600 V
- Closed and open enclosures

Requirements
- Motors without this label will not be allowed through

![Energy Efficiency Label]

IE1
NORTH AMERICA

Canada
United States of America
Mexico
EEA C390-10

Aplicable to:
- Output from 1 to 500 cv (2, 4, 6 and 8 poles)
- Voltage 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
- 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)

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
- Carcaça NEMA 56 ODP

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

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)
EISA 2014
NEMA MG-1
DOE 10 CFR Part 431

Aplicable to:
- Output from 1 to 500 cv (2, 4, 6 and 8 poles)
- Voltage 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
- 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)
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- Gear motors (if the motor can be removed from the gear)
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- Dedicated VFD design (not suitable for DOL)
- Submersible motors (IP68)
- Multispeed motors
- Design D
- TEAO or ODP AO
- Intermittent duty motors (S2-S8)
- Stator-rotor sets
- Water cooled motors
- Two digit frames (42 and 48)
- 56 frame ODP
- Carcaça NEMA 56 ODP

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

Penalties for violations:
$110 per violation per day
NOM-016-ENER-2010

**Aplicable to:**
- Output from 1 to 500 cv (2, 4, 6 and 8 poles)
- Voltage 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
- 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)

**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)
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- 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)

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

Australia,
New Zealand
Fiji
GEMS Act of 2012
AS/NZS 1359.5 : 2004

Applicable to:
- Output 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
- Minimum efficiency level E2 or E3 as per AS/NZS 1359.5
- Efficiency level shall be detailed on motor nameplate
- Motor design must be registered
ASIA

Saudi Arabia
India
Japan
South Korea
Singapore
China
SAUDI ARABIA

SASO IEC 60034-30:2013

Applicable to:
- Output 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
**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

**Requirements**
- 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

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.
Applicable to:
- Output 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
SOUTH KOREA

MKE-2015-28
KS C IEC60034

Applicable to:
- Output from 0.75 to 200 kW (2, 4, 6 and 8 poles)
- Output 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.

IE3
IEC 60034-2-1
IEEE 112

Applicable to:
- Three-phase asynchronous induction motor
- Motor for safe area
- Single speed motor (including dedicated VFD design)
- Output from 0.75 to 375 kW
- Motors with 2, 4 and 6 poles
- Frequency: 50 Hz or 50/60 Hz
- Voltage up to 1000 V
- Duty type S1 or S3 (ED ≥ 80% or higher), S6 or S9
- Ambient temperature: -30 °C at 60 °C

Not applicable to:
- Motors wholly immersed in a liquid;
- Motors completely integrated into a product
- Motors supplied exclusively to third parties that will incorporate the motors in equipment that will be exported to other countries
- Motors with double or triple polarity, break motor and design D

Requirements
Nameplate shall detail:
- IE code IE3;
- Efficiency values at 50, 75 and 100% load (not mandatory to small motors)
- Manufacturing year
GB 18613-2012

Applicable to:
- Output 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
- Increased safety motors (Ex eb)
- Ambient temperature: -20 °C up to 40 °C
- Three-phase asynchronous induction motor

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

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

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