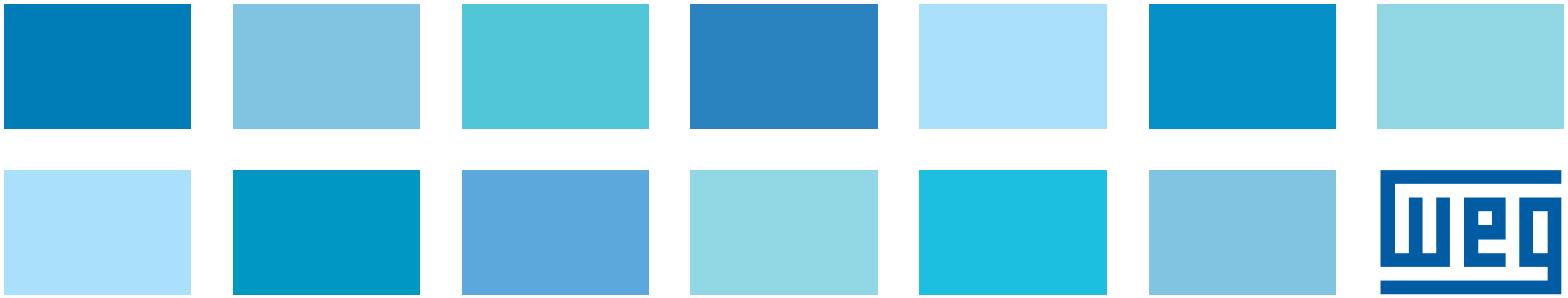
GLOBAL MEPS GUIDE FOR LOW VOLTAGE MOTORS



Understanding MEPS

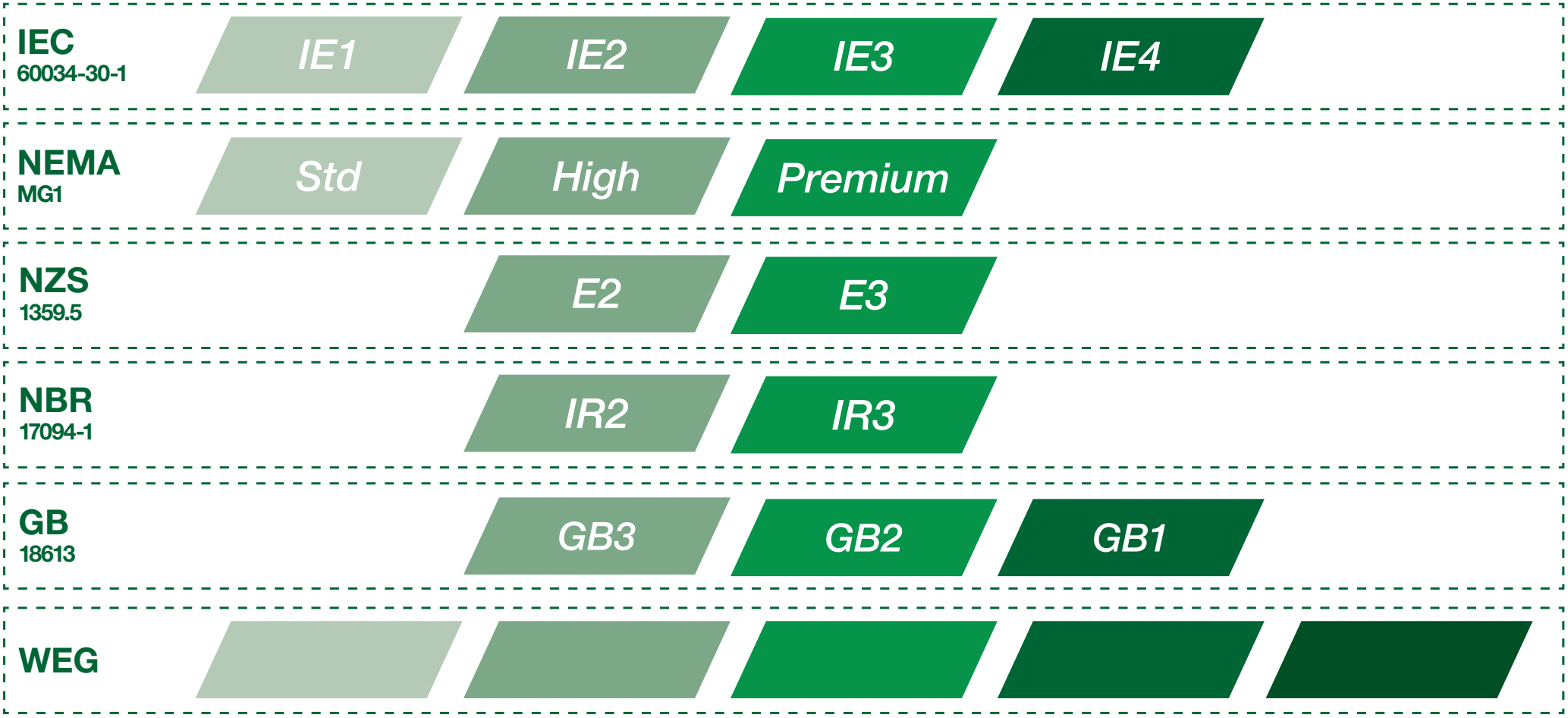
The increasing demand for electrical energy to sustain global development requires consistent heavy investment in power supply generation. However, in addition to complex medium and long term planning, these investments rely on natural resources, which are becoming depleted due to constant pressures 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 imposed 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 today offers 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



Guide to Mandatory Efficiency Regulations Worldwide Overwiew

Legend

The efficiency levels are according to the data square of page 3.
Countries in gray color do not have established local Regulations for Minimum Energy Performance Standards.

Predicted Changes

Country	Current Efficiency Level	New Efficiency Level	When will it change	What will it change	Certifying Body/ Requirement
Europe	IE3 or IE2 with VFD (2 to 6 poles)	IE3	07/2021	■ Includes 8-pole motors. ■ Extends the range of three-phase safe area motors (0.75 to 1000 kW). ■ Includes three-phase safe area motors able to operate with VFD. ■ Includes three-phase motors Ex ec, Ex tb, Ex tc, Ex dc, Ex db, Ex db eb.	CE
		IE4	07/2023	■ Three-phase safe area motors (75 to 200 kW of 2 to 6 poles).	
	-	IE2	07/2021	■ Three-phase motors of 2 to 8 poles for safe area and Ex ec, Ex tb, Ex tc, Ex dc, Ex db, Ex db eb hazardous area (0,12 to <0,75 kW).	
			07/2023	■ Three-phase motors of 2 to 8 poles Ex eb (0,12 to 1000 kW). ■ Single-phase motors of 2 to 8 poles (>0,12 kW).	
Colombia	IE2	IE3	09/2020	■ Three-phase motors of 7,5 to 375 kW (without VFD).	RETIQ
			09/2021	■ Three-phase motors of 0,75 to 375 kW (without VFD).	
New Zealand	E2	IE2	11/2020	■ It takes effect the Regulation GEMS Act of 2019.	GEMS
Ukraine	-	IE3	09/2021	■ It takes effect the Decreee N° 157, a Resolução N° 804 and the Resolution N° 1184.	CE

SOUTH AMERICA

Argentina

Brazil

Chile

Colombia

Ecuador

Peru

ARGENTINA

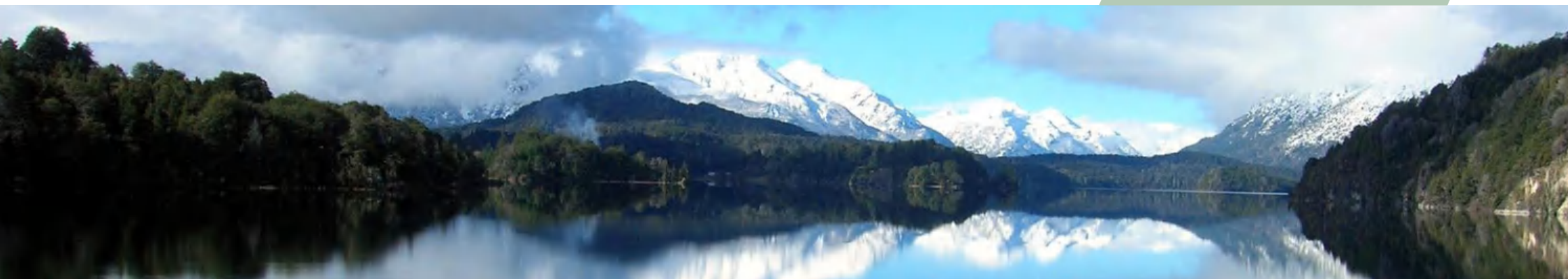
Regulation	PCI 007/17	
Standard	IRAM 62409:2014	IRAM 62405:2012
Power supply system	Single-phase	Three-phase
Minimum energy performance	IE00	IE0
Minimum energy performance when is able to operate with inverter frequency	Not applicable	IE0
Output (kW)	0,12 up to 7,5 kW	0,75 up to 30 kW
Number of poles	2 / 4 / 6	2 / 4 / 6
Voltage (V)	up to 200 V	up to 380 V
Frequency (Hz)	50 Hz or 50/60 Hz	
Service Duty	S1	
Cooling method	TEFC, ODP	
Degree of protection	IP 2X up to IP 66	
Area classification	Safety area	
Altitude	All	
Ambient temperature	All	
Required documentation	Certificate	

** 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

- Energy efficiency level label.

Minimum efficiency level: regulation does not set a minimum efficiency level for motors.



BRAZIL

Regulation	Portaria nº 01/2017
Standard	ABNT NBR 17094-1
Power supply system	Three-phase
Minimum energy performance	IR3
Minimum energy performance when is able to operate with inverter frequency	IR3
Output (kW)	0.12 up to 370 kW (0,16 up to 500 cv)
Number of poles	2, 4, 6 and 8
Voltage (V)	up to 1000 V
Frequency (Hz)	60 Hz or 60/50 Hz
Service Duty	S1 or S3 ≥ 80%
Cooling method	TEFC, ODP, TEAO
Degree of protection	IP 00 up to IP 66
Area classification	Safety and hazardous area (only Ex ec)
Altitude	All
Ambient temperature	All
Required documentation	Register by model

Requirements

- Mandatory label (can be on the motor nameplate).

IR3

CHILE

Regulation	NCh 3086 of 2008
Standard	IEC60034-30-1
Power supply system	Three-phase
Minimum energy performance	IE2
Minimum energy performance when is able to operate with inverter frequency	IE2
Output (kW)	0,75 up to 7,5 kW
Number of poles	2, 4 and 6
Voltage (V)	up to 690 V
Frequency (Hz)	50 Hz or 50/60 Hz
Service Duty	S1
Cooling method	All
Degree of protection	All
Area classification	Safety area
Altitude	All
Ambient temperature	All
Required documentation	Certificate

Requirements

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

IE2

COLOMBIA

			NEW 09/2020	NEW 09/2021
Regulation	RETIQ 2015			
Standard	Resolution nº 4 1012:2015			
Power supply system	Single-phase	Three-phase	Three-phase	Three-phase
Minimum energy performance	IE1	IE2	IE3	IE3
Minimum energy performance when is able to operate with inverter frequency	Not applicable	IE2	IE2	IE2
Output (kW)	0,18 up to 1,5 kW	0,18 up to 375 kW	≥ 7,5 kW	≥ 0,75 kW
Number of poles	2 / 4 / 6	2 / 4 / 6 / 8	2 / 4 / 6 / 8	2 / 4 / 6 / 8
Voltage (V)	up to 240 V	up to 600 V	up to 600 V	up to 600 V
Frequency (Hz)	60 Hz or 50/60 Hz			
Service Duty	S1			
Cooling method	TEFC, ODP			
Degree of protection	IP 00 up to IP 66			
Area classification	Safety area			
Altitude	All			
Ambient temperature	All			
Required documentation	Self declaration			

Requirements

- Energy efficiency level label.

Single-phase IE1
Three-phase IE2

ECUADOR

Regulation	RTE INEN 145	
Standard	IEC60034-30-1	
Power supply system	Single-phase	Three-phase
Minimum energy performance	IE2	IE2
Minimum energy performance when is able to operate with inverter frequency	Not applicable	IE2
Output (kW)	0,18 up to 1,5 kW	0,746 up to 373 kW
Number of poles	2 / 4 / 6	2 / 4 / 6 / 8
Voltage (V)	up to 1000 V	
Frequency (Hz)	60 Hz	
Service Duty	S1	
Cooling method	TEFC, ODP, TEAO	
Degree of protection	IP 00 up to IP 66	All
Area classification	Safety and hazardous area	
Altitude	Up to 4000 m	
Ambient temperature	-20 up to 60 °C	
Required documentation	Self declaration	

IE2

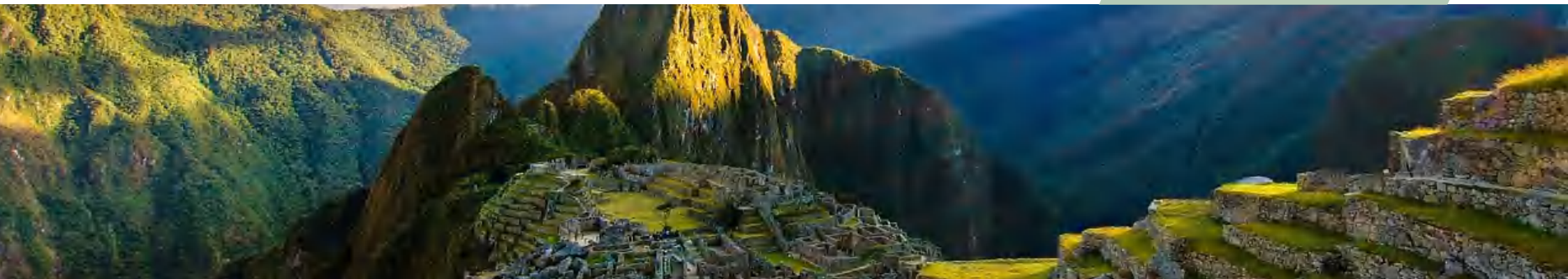
PERU

Regulation	Decreto Supremo N° 009-2017-EM
Standard	Law 27345-2000
Power supply system	Three-phase
Minimum energy performance	IE1
Minimum energy performance when is able to operate with inverter frequency	IE1
Output (kW)	0.75 up to 375 kW
Number of poles	2, 4 and 6
Voltage (V)	up to 600 V
Frequency (Hz)	60 Hz
Service Duty	S1 or S3 ≥ 80%
Cooling method	TEFC, ODP, TEAO
Degree of protection	≥ IP21
Area classification	Safety and hazardous area
Altitude	All
Ambient temperature	All
Required documentation	Certificate

Requirements

- Energy efficiency level label.

IE1



NORTH AMERICA

Canada
United States of America
Mexico

CANADA

Regulation	Amendment 14 to Energy Efficiency Regulations - Small Electric Motors	Amendment 13 to Energy Efficiency Regulations - Electric Motors
Standard	IEEE Std 114-2010, IEEE Std 112-2004, CSA C390-10, CSA C747-09	IEEE Std 112-2004, CSA C390-10
Power supply system	Single-phase or Three-phase	Three-phase
Minimum energy performance	Premium	NEMA Premium
Minimum energy performance when is able to operate with inverter frequency	Not applicable	NEMA Premium
Output (kW)	0.25 up to 3 HP (0,18 up to 2,2 kW) *	1 up to 500 HP (0,75 up to 375 kW)**
Number of poles	2, 4 and 6	2, 4, 6 and 8
Voltage (V)	All	up to 600 V
Frequency (Hz)	60 Hz or 50/60 Hz	
Service Duty	S1	
Cooling method	ODP	TEFC, ODP, TENV, TEBC
Degree of protection	All	
Area classification	Safety area	Safety and hazardous area
Altitude	All	
Ambient temperature	All	
Required documentation	Certificate	

Note:
**Applicable to frame sizes NEMA 42, 48 and 56 (IEC 63 and 71).*
***Applicable to frame sizes from NEMA 143 (IEC 90 and above).*

Premium
NEMA Premium

UNITED STATES OF AMERICA

Regulation	DOE 10 CFR Part 431 - Subpart X - Small Electric Motors	DOE 10 CFR Part 431 - Subpart B - Electric Motors
Standard	IEEE Std 114-2010, IEEE Std 112-2004, CSA C390-10, CSA C747-09	IEEE Std 112-2004, CSA C390-10
Power supply system	Single-phase or Three-phase	Three-phase
Minimum energy performance	Premium	NEMA Premium
Minimum energy performance when is able to operate with inverter frequency	Not applicable	NEMA Premium
Output (kW)	0.25 up to 3 HP (0,18 up to 2,2 kW) *	1 up to 500 HP (0,75 up to 375 kW)**
Number of poles	2, 4 and 6	2, 4, 6 and 8
Voltage (V)	All	up to 600 V
Frequency (Hz)	60 Hz or 50/60 Hz	
Service Duty	S1	
Cooling method	ODP	TEFC, ODP, TENV, TEBC
Degree of protection	All	
Area classification	Safety area	Safety and hazardous area
Altitude	All	
Ambient temperature	All	
Required documentation	Certificate	

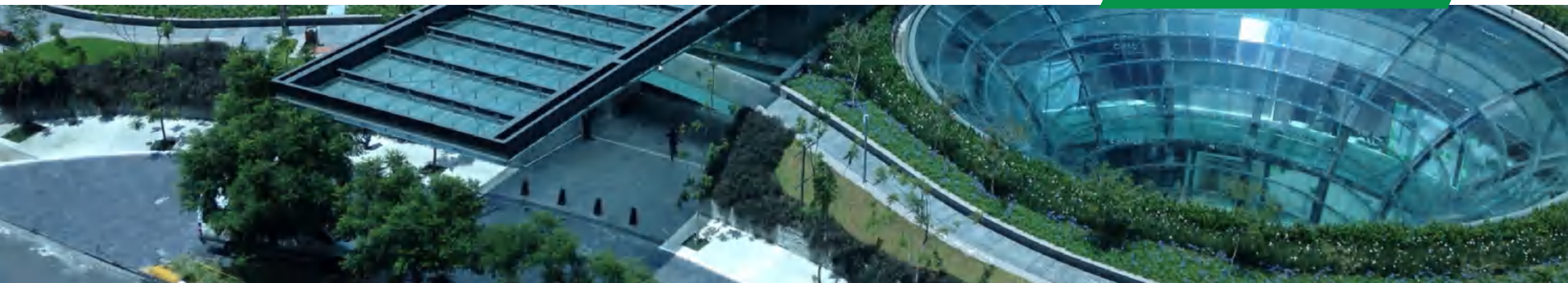
Note:
**Applicable to frame sizes NEMA 42, 48 and 56 (IEC 63 and 71).*
***Applicable to frame sizes from NEMA 143 (IEC 90 and above).*

Premium
NEMA Premium

MEXICO

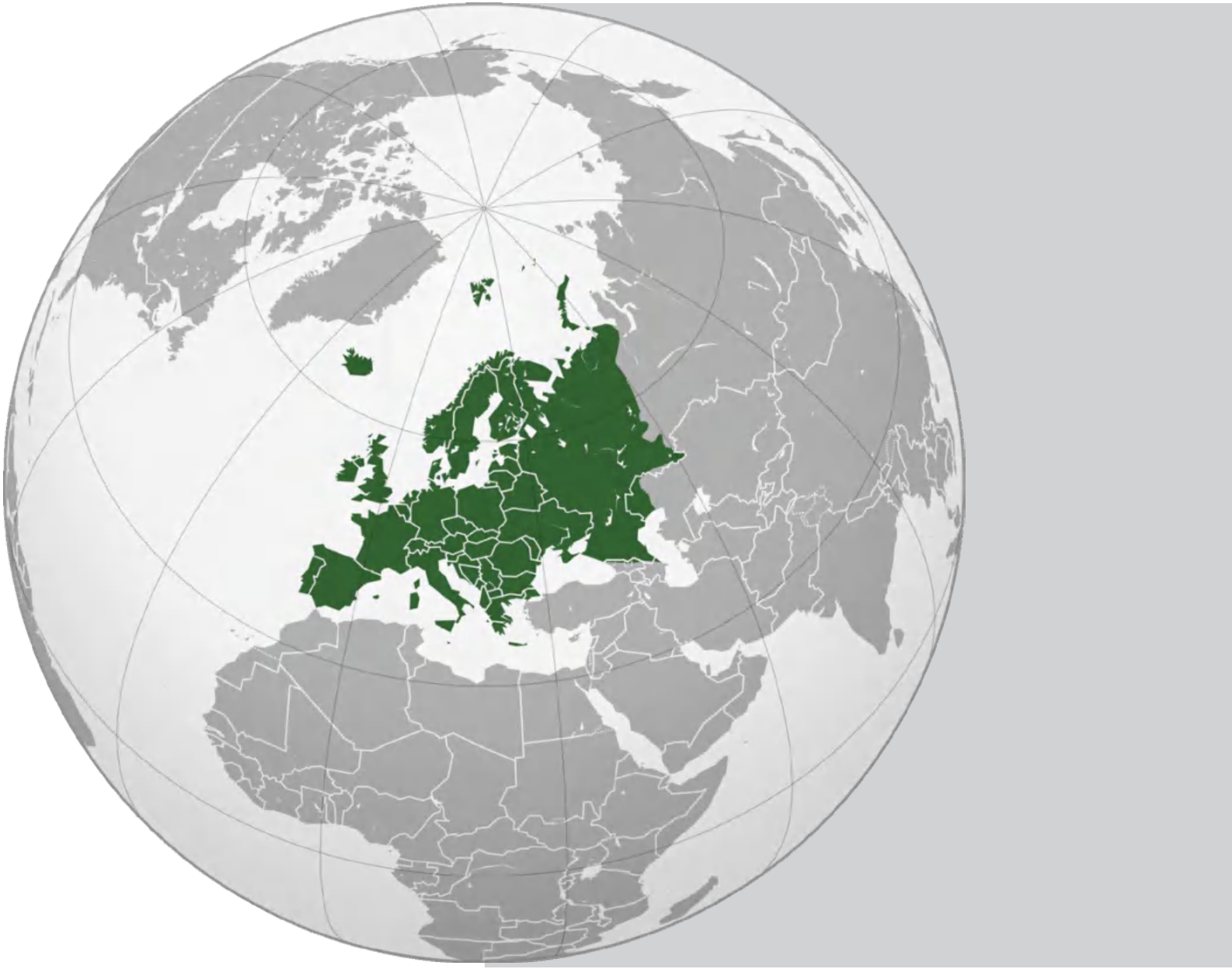
Regulation	NOM-014-ENER-2004	NOM-016-ENER-2016
Standard	NOM-014-ENER-2004	NOM-016-ENER-2016
Power supply system	Single-phase	Three-phase
Minimum energy performance	-	NEMA Premium
Minimum energy performance when is able to operate with inverter frequency	-	NEMA Premium
Output (kW)	0.18 up to 1.5 kW	1 up to 500 HP (0,75 up to 375 kW)
Number of poles	2, 4 and 6	2, 4, 6 and 8
Voltage (V)	All	up to 600 V
Frequency (Hz)	60 Hz or 50/60 Hz	
Service Duty	S1	
Cooling method	All	
Degree of protection	All	
Area classification	Safety area	Safety and hazardous area
Altitude	All	
Ambient temperature	All	
Required documentation	Certificate	

Premium



EUROPE

European Union
Ukraine



EUROPEAN UNION

		NEW 07/2021		NEW 07/2023		
Regulation	Directive 2009-125-EC Regulation 640-2009	Regulation EU 1781/2019				
Standard	IEC 60034-30-1					
Power supply system	Three-phase					Single-phase
Minimum energy performance	IE3	IE3	IE2	IE4	IE2	IE2
Minimum energy performance when is able to operate with inverter frequency	IE2	IE3	IE2	IE4	IE2	Not applicable
Output (kW)	0,75 up to 375 kW	0,75 up to 1000 kW	0,12 up to 0,75 kW	75 up to 200 kW	0,12 up to 0,75 kW	≥ 0,12 kW
Number of poles	2 / 4 / 6	2 / 4 / 6 / 8		2 / 4 / 6		2 / 4 / 6 / 8
Voltage (V)	up to 1000 V					
Frequency (Hz)	50 Hz or 50/60 Hz					
Service Duty	S1, S3 ≥ 80% or S6 ≥ 80%					
Cooling method	TEFC, TEBC, ODP	TEFC, TEBC, ODP, TEAO				
Degree of protection	IP 00 up to IP 66					
Area classification	Safety area	Safety and hazardous area (Ex ec, Ex tc, Ex tb, Ex db, Ex dc, Ex db eb)		Safety area	Hazardous area (Ex eb)	Safety area
Altitude	Up to 4000 m					
Ambient temperature	-30 up to 60 ºC					
Required documentation	Self declaration					

IE3

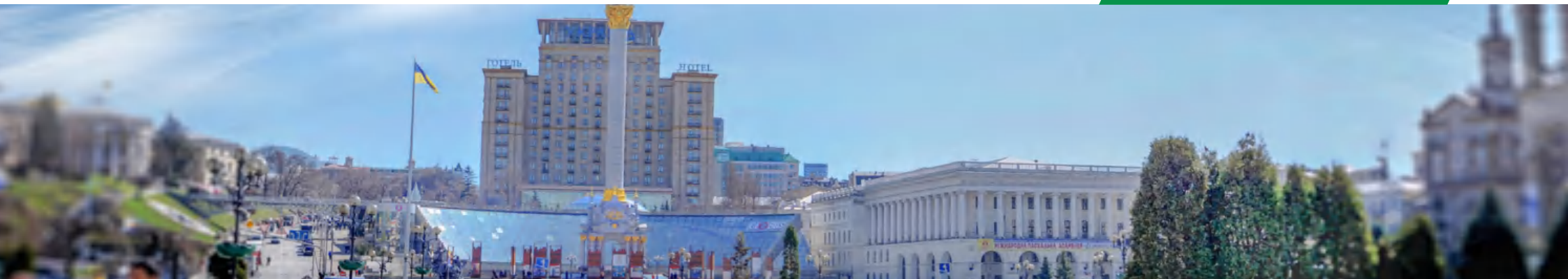
UKRAINE

	NEW 09/2021
Regulation	Decree N° 157, Resolution N° 804 and Resolution N° 1184
Standard	IEC 60034-2-1
Power supply system	Three-phase
Minimum energy performance	IE3
Minimum energy performance when is able to operate with inverter frequency	IE2
Output (kW)	0.75 up to 375 kW
Number of poles	2, 4 and 6
Voltage (V)	up to 1000 V
Frequency (Hz)	50 Hz
Service Duty	S1 or S3 ≥ 80%
Cooling method	All
Degree of protection	All
Area classification	Safety area
Altitude	Up to 4000 m
Ambient temperature	Up to 60 °C
Required documentation	Self declaration

Requirements

- The motor must be identified with the logo.

IE3



OCEANIA

Australia
New Zealand

AUSTRALIA

Regulation	GEMS Act of 2019
Standard	IEC 60034-30-1
Power supply system	Three-phase
Minimum energy performance	IE2
Minimum energy performance when is able to operate with inverter frequency	IE2
Output (kW)	0.73 up to 185 kW
Number of poles	2, 4, 6 and 8 poles
Voltage (V)	up to 1100 V
Frequency (Hz)	50 Hz or 60 Hz
Service Duty	All except S2
Cooling method	TEFC, ODP, TEAO
Degree of protection	IP 00 up to IP 66
Area classification	Safety and hazardous area
Altitude	All
Ambient temperature	All
Required documentation	Register by model

IE2

NEW ZEALAND

		NEW 11/2020
Regulation	AS/NZS 1359.5:2004	GEMS Act of 2019
Standard	IEC 60034-30-1	IEC 60034-30-1
Power supply system	Three-phase	Three-phase
Minimum energy performance	E2	IE2
Minimum energy performance when is able to operate with inverter frequency	E2	IE2
Output (kW)	0.73 up to 185 kW	0.73 up to 185 kW
Number of poles	2, 4, 6 and 8 poles	2, 4, 6 and 8 poles
Voltage (V)	up to 1100 V	up to 1100 V
Frequency (Hz)	50 Hz or 60 Hz	50 Hz or 60 Hz
Service Duty	All except S2	All except S2
Cooling method	TEFC, ODP, TEAO	TEFC, ODP, TEAO
Degree of protection	IP 00 up to IP 66	IP 00 up to IP 66
Area classification	Safety and hazardous area	Safety and hazardous area
Altitude	All	All
Ambient temperature	All	All
Required documentation	Register by model	Register by model

E2

ASIA

Saudi Arabia
India
Japan
South Korea
Singapore
China
Taiwan

SAUDI ARABIA

Regulation	BOD MEETING N° 163	
Standard	SASO 2893:2018	
Power supply system	Three-phase	Three-phase
Minimum energy performance	IE3	IE1
Minimum energy performance when is able to operate with inverter frequency	IE3	IE1
Output (kW)	0.75 up to 375 kW	
Number of poles	2, 4, 6 and 8 poles	
Voltage (V)	up to 1000 V	
Frequency (Hz)	60 Hz or 50/60 Hz	
Service Duty	S1, S3 ≥ 80%	All
Cooling method	TEFC, ODP	All
Degree of protection	IP 00 up to IP 66	
Area classification	Safety area	Safety area, when different of S1 and S3≥80%, and hazardous area
Altitude	Up to 4000 m	
Ambient temperature	-20 up to 60 °C	
Required documentation	Energy Efficiency Certificate by model	Exclusive application certificate by model

Requirements

- Smart Code on the nameplate, used on the motor register.

IE3

INDIA

Regulation	The Gazette of India S.O.178
Standard	IS 12615:2018
Power supply system	Three-phase
Minimum energy performance	IE2
Minimum energy performance when is able to operate with inverter frequency	IE2
Output (kW)	0.12 up to 1000 kW
Number of poles	2, 4, 6 and 8 poles
Voltage (V)	up to 1000 V
Frequency (Hz)	50 Hz or 50/60 Hz
Service Duty	S1
Cooling method	IC411 (TEFC), IC416, IC417, IC418 (TEAO)
Degree of protection	IP 23 up to IP 66
Area classification	Safety area
Altitude	Up to 4000 m
Ambient temperature	-20 up to 60 °C
Required documentation	Certificate

Requirements

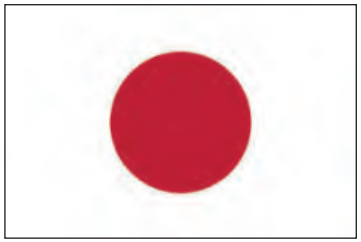
- The motor must be identified with the logo.

IS 12615

IE2

Motores elétricos de indução trifásicos que não estão abrangidos pelo escopo da Norma IS 12615:2018 poderão continuar a serem vendidos e instalados na Índia normalmente.

JAPAN

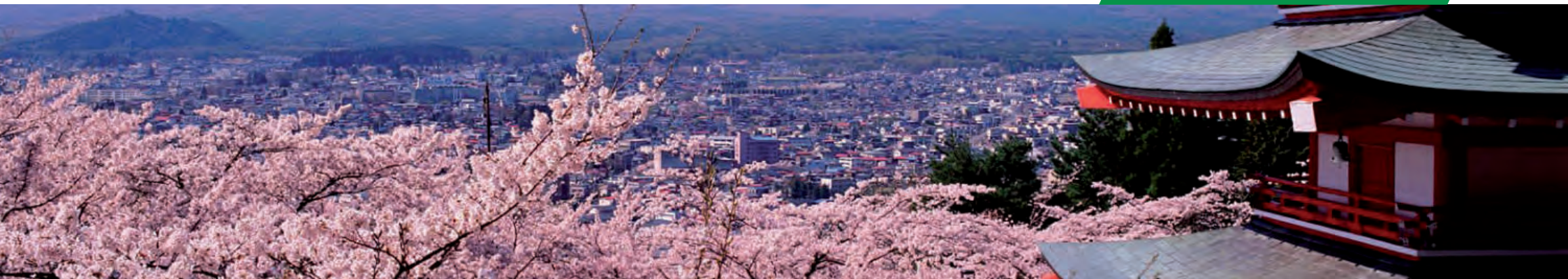


Regulation	Energy Saving Act / Top Runner Program
Standard	JIS C 4034-30
Power supply system	Three-phase
Minimum energy performance	IE3
Minimum energy performance when is able to operate with inverter frequency	-
Output (kW)	0.75 up to 375 kW
Number of poles	2, 4 and 6 poles
Voltage (V)	up to 1000 V
Frequency (Hz)	50 Hz, 60 Hz or 50/60 Hz
Service Duty	S1, S3 ≥ 80%
Cooling method	All
Degree of protection	All
Area classification	Safety area
Altitude	All
Ambient temperature	From -20 °C and above
Required documentation	Self declaration

Requirements

- Importer must provide a self declaration for Efficiency level.

IE3



SOUTH KOREA

Regulation	MKE-2017-206
Standard	KS C IEC 60034
Power supply system	Three-phase
Minimum energy performance	IE3
Minimum energy performance when is able to operate with inverter frequency	-
Output (kW)	0.75 up to 375 kW
Number of poles	2, 4, 6 and 8 poles
Voltage (V)	up to 600 V
Frequency (Hz)	60 Hz
Service Duty	S1, S3 > 80%
Cooling method	TEFC, ODP
Degree of protection	All
Area classification	Safety and hazardous area
Altitude	All
Ambient temperature	-15 up to 40 °C
Required documentation	Register by model

Requirements

- Energy efficiency level label.

IE3

SINGAPORE

Regulation	Energy Conservation Act (Cap. 92C)
Standard	IEC 60034-2-1
Power supply system	Three-phase
Minimum energy performance	IE3
Minimum energy performance when is able to operate with inverter frequency	IE3
Output (kW)	0.75 up to 375 kW
Number of poles	2, 4 and 6 poles
Voltage (V)	up to 1000 V
Frequency (Hz)	50 Hz or 50/60 Hz
Service Duty	S1, S3 ≥ 80%, S6 or S9
Cooling method	TEFC, ODP, TEAO
Degree of protection	All
Area classification	Safety area
Altitude	up to 1000 m
Ambient temperature	-30 up to 60 °C
Required documentation	Certificate

Requirements

- Importer‘s register.

IE3

CHINA

Regulation	Decree nº 35
Standard	GB 18613-2012
Power supply system	Three-phase
Minimum energy performance	GB3
Minimum energy performance when is able to operate with inverter frequency	GB3
Output (kW)	0.75 up to 375 kW
Number of poles	2, 4 and 6 poles
Voltage (V)	up to 1000 V
Frequency (Hz)	50 Hz or 50/60 Hz
Service Duty	S1 or S3 ≥ 80%
Cooling method	TEFC
Degree of protection	IP44 up to IP 66
Area classification	Safe and hazardous area
Altitude	up to 1000 m
Ambient temperature	-20 up to 40 °C
Required documentation	Register by model

Requirements

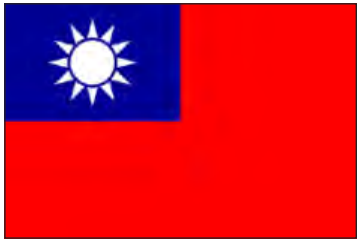
- Energy efficiency level label.

Nameplate shall record:

- Name of manufacturer in Chinese
- Marking GB 18613-2012 and its efficiency value
- Term “Three-phase induction motor“

GB3

TAIWAN



Regulation	Efficiency Standard and Benchmarks and BSMI Regulatory Inspection	
Standard	CNS 14400	
Power supply system	Three-phase	
Minimum energy performance	IE3	
Minimum energy performance when is able to operate with inverter frequency	-	
Output (kW)	0.75 up to 375 kW	
Number of poles	2, 4 and 6 poles	
Voltage (V)	up to 600 V	
Frequency (Hz)	60 Hz or 50/60 Hz	
Service Duty	S1	
Cooling method	All	
Degree of protection	All	
Area classification	Safety area	Hazardous area
Altitude	All	
Ambient temperature	up to 40 °C	
Required documentation	-	Certificate and register

IE3

For WEG's worldwide
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