



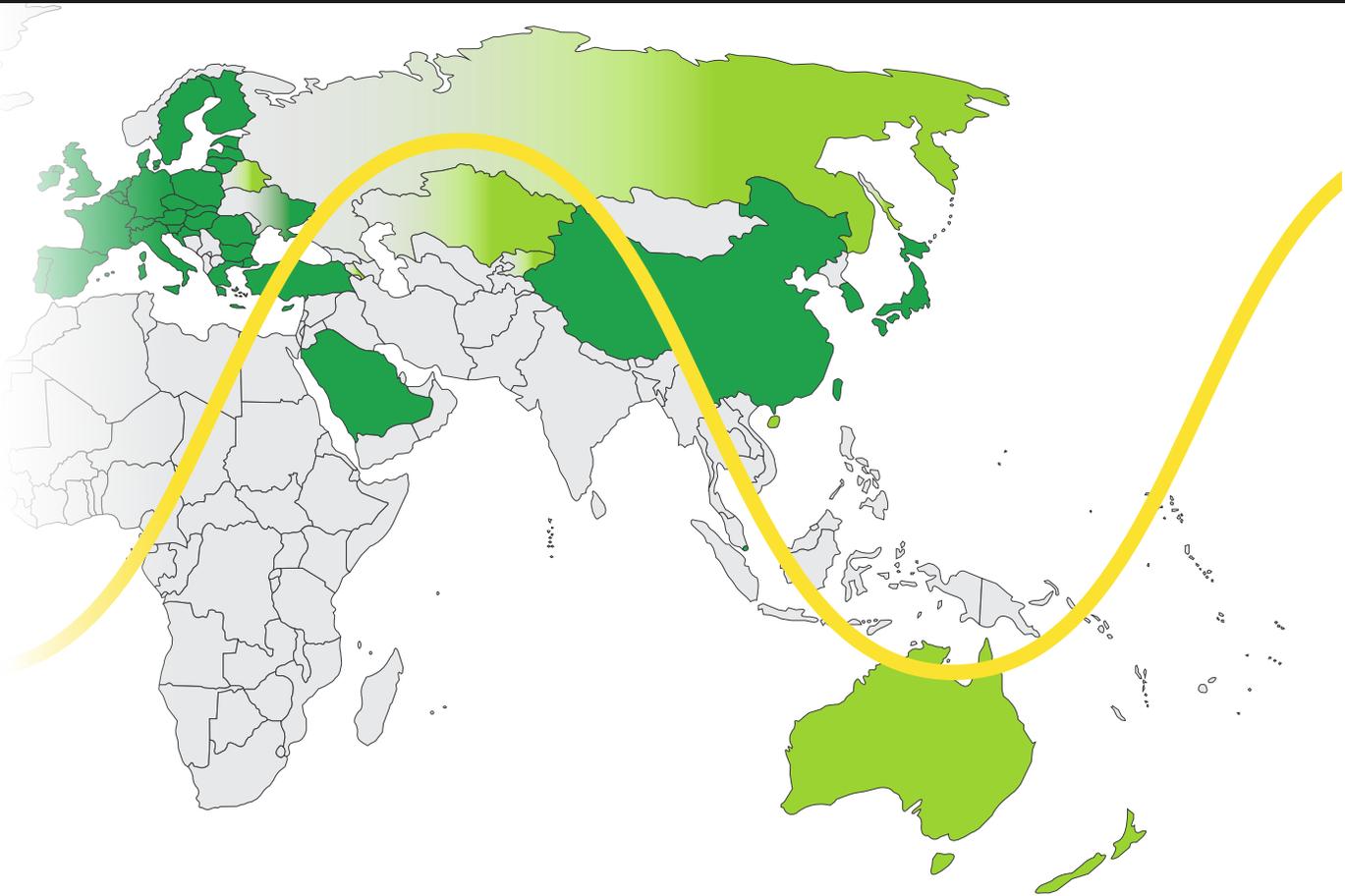
**International
Efficiency
Regulations
for
Electric Motors**

Binding energy efficiency regulations



Extract of global efficiency classes

 IEC 60034-30-1	 NEMA MG-1	 GB 18613	 NBR 17094-1	 AS/NZS 1359.5	 IS 12615	 SASO 2893	 KS C IEC 60034	 JIS C 4034-30	 TR EAWU 048/2019
IE1	Standard			IE1	IE1	IE1	IE1	IE1	IE1
IE2	High		IR2	IE2	IE2	IE2	IE2	IE2	IE2
IE3	Premium	Grade 3	IR3	IE3	IE3	IE3	IE3	IE3	IE3
IE4	Super Premium	Grade 2			IE4	IE4	IE4	IE4	
IE5		Grade 1							



Country	IE-CLASS	PAGE	Country	IE-CLASS	PAGE
Australia / New Zealand	IE2	19	Mexico	IE3	5
Brazil	IE3	7	Saudi Arabia	IE3	15
Canada	IE3	4	Singapore	IE3	19
Chile	IE2	7	South Korea	IE3	17
China	IE3	16	Switzerland	IE3	10, 11
Colombia	IE2	6	Taiwan	IE3	18
Ecuador	IE2	6	Turkey	IE3	12, 13
Eurasian Economic Union	IE1 IE2	14	Ukraine	IE1 IE3	15
Europe / United Kingdom Great Britain and Northern Ireland	IE3	8, 9	USA	IE3	4
India	IE2	17	Rest of the World	IE1	
Japan	IE3	18			

All information on country-specific regulations in this brochure is subject to change at short notice due to corresponding country requirements. We therefore assume no liability for the accuracy, correctness and completeness of the information provided here.

Canada



USA



Efficiency Standard	NEMA MG-1
Efficiency Regulation	EER 2016
Valid since	28/06/2017
Efficiency Requirement	Premium (IE3)
Applicable for	<ul style="list-style-type: none"> • Single-speed, three-phase, 50 Hz, 50/60 Hz, 60 Hz cage induction motors • 2-pole, 4-pole, 6-pole and 8-pole motors • Nominal rated output power between 0.75 kW (1 HP) and 375 kW (500 HP) • Nominal rated voltage U_N up to 600 V • Designed for continuous operation (MG1) or S1 (IEC) • Geared motors • Brake motors
Exceptions	<ul style="list-style-type: none"> • Motors which are designed in such a way that they can be operated submerged in a fluid • At altitudes exceeding 1000 metres above sea level • Motors with external cooling via third-party cooling which is not an integral component of the motor itself • Motors especially designed for inverter operation • Pole-changing motors • Motors designed for operating modes other than S1 • Single-phase motor • PMSM • Fixtures (stator + rotor) as component

Efficiency Standard	NEMA MG-1
Efficiency Regulation	DOE 10 CFR Part 431
Valid since	01/06/2016
Efficiency Requirement	Premium (IE3)
Applicable for	<ul style="list-style-type: none"> • Single-speed, three-phase, 60 Hz cage induction motors • Operated with sinusoidal voltage supply • 2-pole, 4-pole, 6-pole and 8-pole motors • Nominal rated output power between 0.75 kW (1 HP) and 375 kW (500 HP) • Nominal rated voltage U_N up to 600 V • Designed for continuous operation (MG1) or S1 (IEC) • Geared motors • Brake motors
Exceptions	<ul style="list-style-type: none"> • Motors which are designed in such a way that they can be operated submerged in a fluid • At altitudes exceeding 1000 metres above sea level • Motors which are cooled via IC418 ambient air • Motors which are cooled via fluids • Motors especially designed for inverter operation • Pole-changing motors • Motors designed for operating modes other than S1 • Single-phase motor • PMSM

Mexico



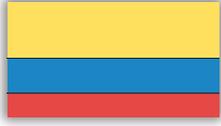
Efficiency Standard	NEMA MG-1
Efficiency Regulation	NOM-016-ENER-2016
Valid since	13/01/2017
Efficiency Requirement	Premium (IE3)
Applicable for	<ul style="list-style-type: none"> • Single-speed, three-phase, 60 Hz cage induction motors • 2-pole, 4-pole, 6-pole and 8-pole motors • Nominal rated output power between 0.746 kW (1 HP) and 373 kW (500 HP) • Nominal rated voltage U_N up to 600 V • Designed for continuous operation (MG1) or S1 (IEC) • Geared motors • Brake motors

Exceptions

- Motors which are designed in such a way that they can be operated submerged in a fluid
- At altitudes exceeding 1000 metres above sea level
- Motors which are cooled via IC418 ambient air
- Motors which are cooled via fluids
- Motors especially designed for inverter operation
- Pole-changing motors
- Motors designed for operating modes other than S1
- Single-phase motor
- PMSM



Colombia



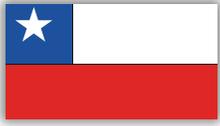
Efficiency Standard	Resolución no4 1012:2015						
Efficiency Regulation	Resolución no4 1012:2015						
Valid since	31/08/2018						
Efficiency Requirement	IE2						
Applicable for	<ul style="list-style-type: none"> • Single-speed, three-phase, 60 Hz cage induction motors • 2-pole, 4-pole, 6-pole and 8-pole motors • Nominal rated output power between 0.12 kW and 370 kW • Nominal rated voltage U_N up to 1000 V • Continuous operation (S1 Mode) and $S3 \geq 80\%$ • Brake motors • Geared motors 						
Exceptions	<ul style="list-style-type: none"> • At altitudes > 1000 metres above sea level • At ambient temperatures above + 40° C • At ambient temperatures below – 15° C • Ex-Motors • Motors especially designed for inverter operation • Pole-changing motors • Motors designed for operating modes other than S1 and < S3-80% • Single-phase motors • PMSM 						
Valid from	31/08/2020						
Efficiency Requirement	<table border="0"> <tr> <td>< 7.5 kW</td> <td>IE2</td> </tr> <tr> <td>≥ 7.5 kW</td> <td>IE3</td> </tr> <tr> <td>for VSD</td> <td>IE2</td> </tr> </table>	< 7.5 kW	IE2	≥ 7.5 kW	IE3	for VSD	IE2
< 7.5 kW	IE2						
≥ 7.5 kW	IE3						
for VSD	IE2						
Valid from	31/08/2021						
Efficiency Requirement	<table border="0"> <tr> <td>< 0.75 kW</td> <td>IE2</td> </tr> <tr> <td>≥ 0.75 kW</td> <td>IE3</td> </tr> <tr> <td>for VSD</td> <td>IE2</td> </tr> </table>	< 0.75 kW	IE2	≥ 0.75 kW	IE3	for VSD	IE2
< 0.75 kW	IE2						
≥ 0.75 kW	IE3						
for VSD	IE2						

Ecuador



Efficiency Standard	RTE INEN 145
Efficiency Regulation	17 524 - 2017
Valid since	23.11.2018
Efficiency Requirement	IE2
Applicable for	<ul style="list-style-type: none"> • Single-phase motors <ul style="list-style-type: none"> ◊ 2-pole, 4-pole and 6-pole motors ◊ Nominal rated output power between 0,18 kW and 1,5 kW ◊ Nominal rated voltage U_N bis 240 V • Three-phase motors <ul style="list-style-type: none"> ◊ Single-speed, 60 Hz cage induction motors ◊ 2-pole, 4-pole, 6-pole or 8-pole motors ◊ Nominal rated output power between 0,746 kW and 373 kW ◊ Nominal rated voltage U_N 1000 V ◊ Continuous operation S1
Exeptions	<ul style="list-style-type: none"> • Motors which are designed in such a way that they can be operated submerged in a fluid • Motors which are completely built into a product (e.g. a gearbox, a pump, a fan or a compressor), and where the energy efficiency of which cannot be recorded independently of that product

Chile



Efficiency Standard	PE N° 7/01/2 IEC 60034-30
Efficiency Regulation	NCh 3086 of 2008
Valid since	04.01.2011
Efficiency Requirement	≥ 0,75 kW – 7,5 kW: IE2
Applicable for	<ul style="list-style-type: none"> • Single-speed, three-phase, 50 Hz cage induction motors • 2-pole, 4-pole or 6-pole motors • Nominal rated output power between 0.75 kW and 375 kW • Nominal rated voltage U_N up to 1000 V • Continuous operation
Exceptions	<ul style="list-style-type: none"> • Motors especially designed for inverter operation • Brake motors

Brazil



Efficiency Standard	ABNT NBR 17094-1
Efficiency Regulation	Portaria Interministerial N° 1
Valid since	01/08/2019
Efficiency Requirement	IR3 (IE3)
Applicable for	<ul style="list-style-type: none"> • Single-speed, three-phase, 60 Hz cage induction motors • 2-pole, 4-pole, 6-pole and 8-pole motors • Nominal rated output power between 0.12 kW and 370 kW • Nominal rated voltage U_N up to 1000 V • Continuous operation (S1 Mode) and S3 > = 80% • Brake motors • Geared motors
Exceptions	<ul style="list-style-type: none"> • At altitudes exceeding 1000 metres above sea level • At ambient temperatures above + 40° C • At ambient temperatures below – 15° C • Ex-Motors • Motors especially designed for inverter operation • Pole-changing motors • Motors designed for operating modes other than S1 and < S3-80% • Single-phase motors • PMSM

Europe / United Kingdom Great Britain and Northern Ireland



Efficiency Standard	IEC 60034-30
Efficiency Regulation	(EC) 640/2009 + (EU) 4/2014
Valid since	01/01/2017
Efficiency Requirement	IE3 + IE2 for inverter duty
Applicable for	<ul style="list-style-type: none"> • Single-speed, three-phase, 50 Hz and 50/60 Hz cage induction motors • 2-pole, 4-pole or 6-pole motors • Nominal rated output power between 0.75 kW and 375 kW • Nominal rated voltage U_N up to 1000 V • Continuous operation
Exceptions	<ul style="list-style-type: none"> • Motors which are designed in such a way that they can be operated submerged in a fluid • Motors which are completely built into a product (e.g. a gearbox, a pump, a fan or a compressor), and where the energy efficiency of which cannot be recorded independently of that product • At altitudes exceeding 4000 metres above sea level • At ambient temperatures above 60° C • At ambient temperatures below - 30° C (any motor) and/or at ambient temperatures below 0° C (air-cooled motor) • In potentially explosive atmospheres within the meaning of Directive 94/9/EC of the European Parliament and of the Council • Brake motors

Efficiency Standard	IEC 60034-30
Efficiency Regulation	(EU) 2019/1781
Valid from	01/07/2021
Applicable for	<ul style="list-style-type: none"> • Frequency inverter 0.12 – 1,000 kW : IE2 • 3-phase motors 0,12 kW to <0,75 kW/ 2-pole, 4-pole, 6-pole or 8-pole: IE2 (except for: Ex eb (DXE)) • 3-phase motors 0.75 – 1,000 kW / 2-pole, 4-pole, 6-pole or 8-pole: IE3 (except for: Ex eb (DXE)) <p> Brake motors are no longer excluded</p>
Valid from	01/07/2023
Applicable for	<ul style="list-style-type: none"> • 1-phase motors ≥ 0.12 kW: IE2 • Ex eb (DXE) motors ≥ 0.12 kW: IE2 • 3-phase motors 75 kW – 200 kW / 2-pole, 4-pole or 6-pole: IE4 (except for: Brake motors and all explosion-protected motors)
Scope of validity	<p>Induction motors without carbon brushes, commutators, slip rings or electrical rotor connections which are designed to be operated on a sinusoidal voltage of 50 Hz, 60 Hz or 50/60 Hz and which have the following characteristics:</p> <ul style="list-style-type: none"> ◇ 2-pole, 4-pole, 6-pole and 8-pole motors ◇ Nominal rated power P_N between 0.12 kW and 1000 kW ◇ Nominal rated voltage U_N above 50 V up to, and including, 1000 V ◇ Which are designed for continuous mode (S1, S3 $\geq 80\%$ ED, S6 $\geq 80\%$ ED) and ◇ which are intended for direct mains operation

Europe / United Kingdom Great Britain and Northern Ireland

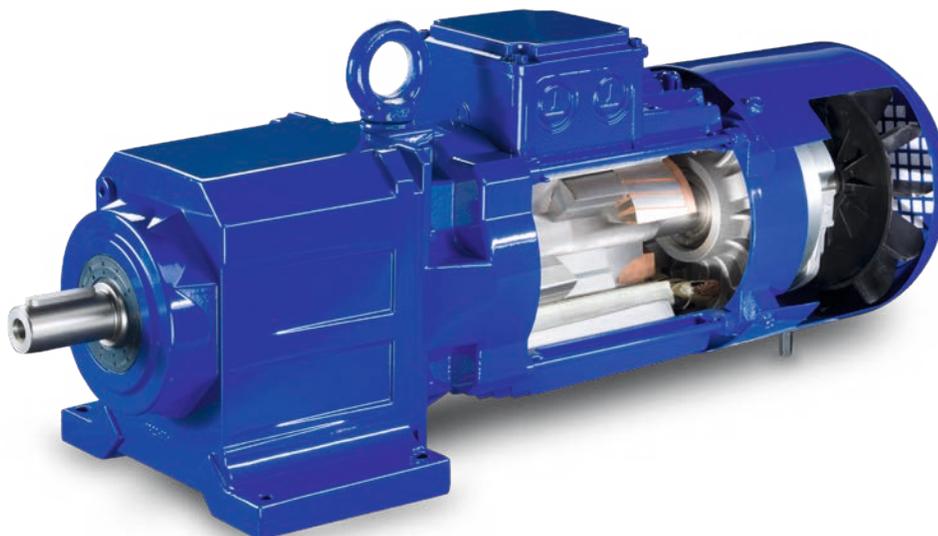


Exceptions

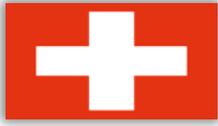
- Motors which are designed in such a way that they can be operated submerged in a fluid
- Motors which are completely built into a product (e.g. a gearbox, a pump, a fan or a compressor), whereby the energy efficiency of which cannot be recorded independently of these products
- Motors with integrated frequency inverters (compact drive units) whose energy efficiency cannot be tested independently of the frequency inverter
- Specially designed and specified motors which are exclusively for the following operating conditions:
 - ◊ At altitudes exceeding 4000 m above sea level
 - ◊ At ambient temperatures above + 60° C
 - ◊ At ambient temperatures below – 30° C
- Motors with an integrated brake which is an integral part of the internal motor design and cannot be removed or powered from a separate power source when testing motor efficiency.

Exceptions

- Motors which are specially designed for the safety of nuclear installations in accordance with Article 3 of Council Directive 2009/71/EURATOM
- Motors with mechanical commutators
- Totally enclosed non-ventilated motors (TENV)
- Motors from the respective scope of application of the two deadlines 01.07.2021 or 01.07.2023, which were placed on the market before these deadlines, may continue to be placed on the market as 1:1 replacements until 30.06.2029 and may be specifically marketed as such
- Multiple-speed motors i.e. pole-changing motors
- Motors which are specially developed for electric conveyor vehicles
- Motors in portable devices whose weight will be carried by hand during operation.
- Motors in hand-held mobile devices which will be moved during operation
- Motors in wireless or battery-powered devices
- Motors for underground mining work (mines)



Switzerland



Efficiency Standard	IEC 60034-30
Efficiency Regulation	EnV 730.02
Valid since	01/01/2017
Efficiency Requirement	IE3 + IE2 for inverter duty
Applicable for	<ul style="list-style-type: none"> • Single-speed, three-phase, 50 Hz and 50/60 Hz cage induction motors • 2-pole, 4-pole or 6-pole motors • Nominal rated output power between 0.75 kW and 375 kW • Nominal rated voltage U_N up to 1000 V • Continuous operation
Exceptions	<ul style="list-style-type: none"> • Motors which are designed in such a way that they can be operated submerged in a fluid • Motors which are completely built into a product (e.g. a gearbox, a pump, a fan or a compressor), and where the energy efficiency of which cannot be recorded independently of that product • At altitudes exceeding 4000 metres above sea level • At ambient temperatures above 60° C • At ambient temperatures below - 30° C (any motor) and/or at ambient temperatures below 0° C (air-cooled motor) • In potentially explosive atmospheres within the meaning of Directive 94/9/EC of the European Parliament and of the Council • Brake motors

Efficiency Standard	IEC 60034-30
Efficiency Regulation	EnV 730.02
Valid from	01/07/2021
Applicable for	<ul style="list-style-type: none"> • Frequency inverter 0.12 – 1,000 kW : IE2 • 3-phase motors 0,12 kW to <0,75 kW/ 2-pole, 4-pole, 6-pole or 8-pole: IE2 (except for: Ex eb (DXE)) • 3-phase motors 0.75 – 1,000 kW / 2-pole, 4-pole, 6-pole or 8-pole: IE3 (except for: Ex eb (DXE)) <p> Brake motors are no longer excluded</p>
Valid from	01/07/2023
Applicable for	<ul style="list-style-type: none"> • 1-phase motors ≥ 0.12 kW: IE2 • Ex eb (DXE) motors ≥ 0.12 kW: IE2 • 3-phase motors 75 kW – 200 kW / 2-pole, 4-pole or 6-pole: IE4 (except for: Brake motors and all explosion-protected motors)
Scope of validity	<p>Induction motors without carbon brushes, commutators, slip rings or electrical rotor connections which are designed to be operated on a sinusoidal voltage of 50 Hz, 60 Hz or 50/60 Hz and which have the following characteristics:</p> <ul style="list-style-type: none"> ◇ 2-pole, 4-pole, 6-pole and 8-pole motors ◇ Nominal rated power P_N between 0.12 kW and 1000 kW ◇ Nominal rated voltage U_N above 50 V up to, and including, 1000 V ◇ Which are designed for continuous mode (S1, S3 $\geq 80\%$ ED, S6 $\geq 80\%$ ED) and ◇ which are intended for direct mains operation

Switzerland

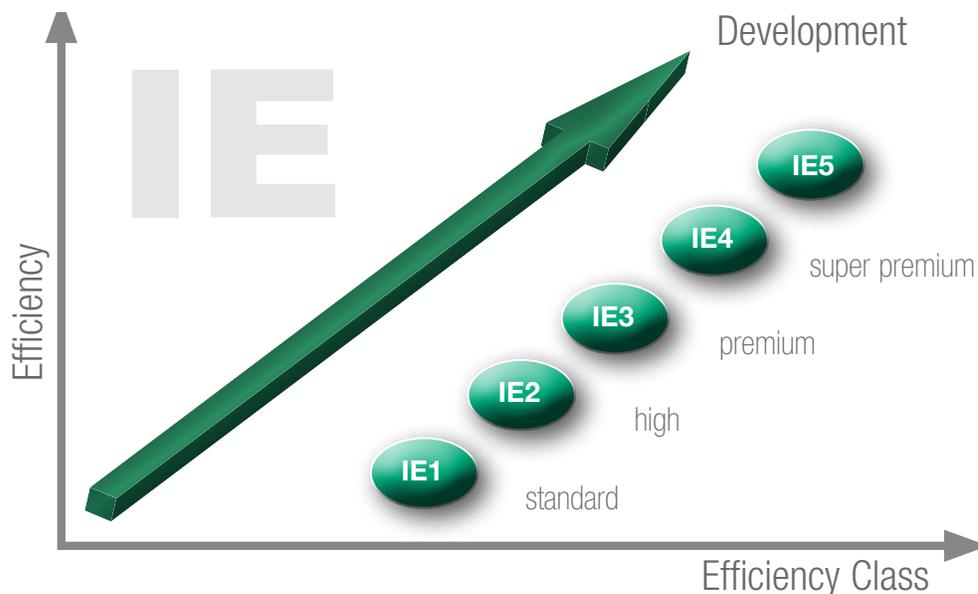


Exceptions

- Motors which are designed in such a way that they can be operated submerged in a fluid
- Motors which are completely built into a product (e.g. a gearbox, a pump, a fan or a compressor), whereby the energy efficiency of which cannot be recorded independently of these products
- Motors with integrated frequency inverters (compact drive units) whose energy efficiency cannot be tested independently of the frequency inverter
- Specially designed and specified motors which are exclusively for the following operating conditions:
 - ◊ At altitudes exceeding 4000 m above sea level
 - ◊ At ambient temperatures above + 60° C
 - ◊ At ambient temperatures below – 30° C
- Motors with an integrated brake which is an integral part of the internal motor design and cannot be removed or powered from a separate power source when testing motor efficiency.

Exceptions

- Motors which are specially designed for the safety of nuclear installations in accordance with Article 3 of Council Directive 2009/71/EURATOM
- Motors with mechanical commutators
- Totally enclosed non-ventilated motors (TENV)
- Motors from the respective scope of application of the two deadlines 01.07.2021 or 01.07.2023, which were placed on the market before these deadlines, may continue to be placed on the market as 1:1 replacements until 30.06.2029 and may be specifically marketed as such
- Multiple-speed motors i.e. pole-changing motors
- Motors which are specially developed for electric conveyor vehicles
- Motors in portable devices whose weight will be carried by hand during operation.
- Motors in hand-held mobile devices which will be moved during operation
- Motors in wireless or battery-powered devices
- Motors for underground mining work (mines)



Turkey



Efficiency Standard	IEC 60034-30
Efficiency Regulation	SGM-2012/2 SGM-2015/15
Valid since	01/01/2017
Efficiency Requirement	IE3 + IE2 for inverter duty
Applicable for	<ul style="list-style-type: none"> • Single-speed, three-phase, 50 Hz and 50/60 Hz cage induction motors • 2-pole, 4-pole or 6-pole motors • Nominal rated output power between 0.75 kW and 375 kW • Nominal rated voltage U_N up to 1000 V • Continuous operation
Exceptions	<ul style="list-style-type: none"> • Motors which are designed in such a way that they can be operated submerged in a fluid • Motors which are completely built into a product (e.g. a gearbox, a pump, a fan or a compressor), and where the energy efficiency of which cannot be recorded independently of that product • Specially designed and specified motors which are exclusively for the following operating conditions: <ul style="list-style-type: none"> • At altitudes exceeding 4000 m above sea level • At ambient temperatures above + 60° C • At ambient temperatures below – 30° C (any motor) and/or at ambient temperatures below 0° C (air-cooled motor) • In potentially explosive atmospheres within the meaning of Directive 94/9/EC of the European Parliament and of the Council • Brake motors

Efficiency Standard	IEC 60034-30
Efficiency Regulation	SGM 2021/16
Valid from	01/07/2021
Applicable for	<ul style="list-style-type: none"> • Frequency inverter 0.12 – 1,000 kW : IE2 • 3-phase motors 0,12 kW to <0,75 kW/ 2-pole, 4-pole, 6-pole or 8-pole: IE2 (except for: Ex eb (DXE)) • 3-phase motors 0.75 – 1,000 kW / 2-pole, 4-pole, 6-pole or 8-pole: IE3 (except for: Ex eb (DXE)) <p> Brake motors are no longer excluded</p>
Valid from	01/07/2023
Applicable for	<ul style="list-style-type: none"> • 1-phase motors ≥ 0.12 kW: IE2 • Ex eb (DXE) motors ≥ 0.12 kW: IE2 • 3-phase motors 75 kW – 200 kW / 2-pole, 4-pole or 6-pole: IE4 (except for: Brake motors and all explosion-protected motors)
Scope of validity	<p>Induction motors without carbon brushes, commutators, slip rings or electrical rotor connections which are designed to be operated on a sinusoidal voltage of 50 Hz, 60 Hz or 50/60 Hz and which have the following characteristics:</p> <ul style="list-style-type: none"> ◇ 2-pole, 4-pole, 6-pole and 8-pole motors ◇ Nominal rated power P_N between 0.12 kW and 1000 kW ◇ Nominal rated voltage U_N above 50 V up to, and including, 1000 V ◇ Which are designed for continuous mode (S1, S3 $\geq 80\%$ ED, S6 $\geq 80\%$ ED) and ◇ which are intended for direct mains operation

Turkey



Exceptions

- Motors which are designed in such a way that they can be operated submerged in a fluid
- Motors which are completely built into a product (e.g. a gearbox, a pump, a fan or a compressor), whereby the energy efficiency of which cannot be recorded independently of these products
- Motors with integrated frequency inverters (compact drive units) whose energy efficiency cannot be tested independently of the frequency inverter
- Specially designed and specified motors which are exclusively for the following operating conditions:
 - ◊ At altitudes exceeding 4000 m above sea level
 - ◊ At ambient temperatures above + 60° C
 - ◊ At ambient temperatures below – 30° C
- Motors with an integrated brake which is an integral part of the internal motor design and cannot be removed or powered from a separate power source when testing motor efficiency.

Exceptions

- Motors which are specially designed for the safety of nuclear installations in accordance with Article 3 of Council Directive 2009/71/EURATOM
- Motors with mechanical commutators
- Totally enclosed non-ventilated motors (TENV)
- Motors from the respective scope of application of the two deadlines 01.07.2021 or 01.07.2023, which were placed on the market before these deadlines, may continue to be placed on the market as 1:1 replacements until 30.06.2029 and may be specifically marketed as such
- Multiple-speed motors i.e. pole-changing motors
- Motors which are specially developed for electric conveyor vehicles
- Motors in portable devices whose weight will be carried by hand during operation.
- Motors in hand-held mobile devices which will be moved during operation
- Motors in wireless or battery-powered devices
- Motors for underground mining work (mines)



Eurasian Economic Union



Efficiency Standard	IEC 60034-30
Efficiency Regulation	TR EAWU 048/2019
EAWU Member States	Armenia Kazakhstan Kyrgyzstan Russia Belarus
Valid from	01/09/2022
Efficiency requirement	IE2 ≥ 0,75 kW - 375 kW
Valid from	01/09/2024
Efficiency requirement	≥ 7,5 kW IE3 for mains operation and IE2 for inverter operation
Valid from	01/09/2026
Efficiency requiremen	≥ 0,75 kW IE3 for mains operation and IE2 for inverter operation
Applicable for	<ul style="list-style-type: none"> • Single-speed, three-phase, 50 Hz and 50/60 Hz cage induction motors • 2-pole, 4-pole or 6-pole motors • Nominal rated output power between 0.75 kW and 375 kW • Nominal rated voltage U_N up to 1000 V • Continuous operation

Exceptions

- Motors which are designed in such a way that they can be operated submerged in a fluid
- Motors which are designed in such a way that they can be operated submerged in a fluid
- Motors which are completely built into a product (e.g. a gearbox, a pump, a fan or a compressor), and where the energy efficiency of which cannot be recorded independently of that product
- Specially designed and specified motors which are exclusively for the following operating conditions:
 - ◇ At altitudes exceeding 4000 m above sea level
 - ◇ At ambient temperatures above + 60° C
 - ◇ At ambient temperatures below – 30° C (any motor) and/or at ambient temperatures below 0° C (air-cooled motor)
 - ◇ In explosive atmospheres
- Brake motors

Ukraine



Based on	(EG) 640/2009
Efficiency Regulation	No. 157, 27.02.2019
Valid from	15.09.2021
Efficiency requirement	≥ 0,75 kW – 375 kW: IE3 + IE2 for inverter operation
Applicable for	<ul style="list-style-type: none"> • Single-speed, three-phase, 50 Hz cage induction motors • 2-pole, 4-pole or 6-pole motors • Nominal rated output power between 0.75 kW and 375 kW • Nominal rated voltage U_N up to 1000 V • Continuous operation
Exceptions	<ul style="list-style-type: none"> • Motors which are designed in such a way that they can be operated submerged in a fluid • Motors which are designed in such a way that they can be operated submerged in a fluid • Motors which are completely built into a product (e.g. a gearbox, a pump, a fan or a compressor), and where the energy efficiency of which cannot be recorded independently of that product • Specially designed and specified motors which are exclusively for the following operating conditions: <ul style="list-style-type: none"> ◇ At altitudes exceeding 4000 m above sea level ◇ At ambient temperatures above + 60° C ◇ At ambient temperatures below – 30° C (any motor) and/or at ambient temperatures below 0° C (air-cooled motor) ◇ In explosive atmospheres • Brake motors

Saudi Arabia



Efficiency Standard	IEC 60034-30-1:2014
Efficiency Regulation	SASO-2893:2018
Valid since	16/08/2018
Efficiency Requirement	IE3
Applicable for	<ul style="list-style-type: none"> • Single-speed, three-phase, 60 Hz, induction motors • 2-pole, 4-pole, 6-pole and 8-pole motors • Nominal rated output power between 0.75 kW and 375 kW • Nominal rated voltage U_N 50 V up to 1000 V • Continuous operation (S1 Mode) • Geared motors • Brake motors
Exceptions	<ul style="list-style-type: none"> • Motors with mechanical commutators • Motors which are designed in such a way that they can be operated submerged in a fluid • Motors which are completely built into a product (e.g. a gearbox, a pump, a fan or a compressor), and where the energy efficiency of which cannot be recorded independently of that product • At altitudes exceeding 4000 metres above sea level • At ambient temperatures above + 60° C • At ambient temperatures below – 20° C • Motors with integrated frequency inverter • Motors specially designed for inverter duty • Motors for Ex-areas according to IEC 60079-0 • Motors with special designs such as for heavy ramp up, special torque rigidity, high switching frequencies, very low rotor inertia • Motors for mains operation differing from IEC 60034 with limited ramp up current, increased voltage and/or frequency tolerances

China



Efficiency Standard	GB 18613-2012
Efficiency Regulation	GB 18613-2012
Valid since	01/10/2016
Efficiency Requirement	IE2
Applicable for	<ul style="list-style-type: none"> • Single-speed, three-phase, 50 Hz cage induction motors • 2-pole, 4-pole, 6-pole motors • Nominal rated output power between 0.75 kW and 375 kW • Nominal rated voltage U_N up to 1000 V • Continuous operation (S1) and S3 – 80% • Geared motors • Brake motors
Exceptions	<ul style="list-style-type: none"> • Motors with mechanical commutators • Motors which are designed in such a way that they can be operated submerged in a fluid • Motors which are completely built into a product (e.g. a gearbox, a pump, a fan or a compressor), and where the energy efficiency of which cannot be recorded independently of that product • At altitudes exceeding 1000 metres above sea level • At ambient temperatures above + 40° C • At ambient temperatures below – 15° C • Pole-changing motors • Motors especially designed for inverter duty

Efficiency Standard	GB 18613-2020 / CEL 007-2021
Efficiency Regulation	GB 18613-2020
Valid since	01.06.2021
Efficiency Requirement	Three-phase: IE3 Single-phase: IE1 / IE1,5
Applicable for	<ul style="list-style-type: none"> • Single-speed AC motors, three-phase, 50 Hz <ul style="list-style-type: none"> ◊ 2-, 4-, 6- and 8-pole motors ◊ Nominal rated output power between 0,12 kW and 1000 kW ◊ Nominal rated voltage U_N up to 1000 V ◊ Continuous operation S1 and S3 > 80 % ◊ Self-ventilated motors (IC411) • Single-speed AC motors, single-phase, 50 Hz <ul style="list-style-type: none"> ◊ Nominal rated voltage U_N up to 690 V ◊ Continuous operation S1 and S3 > 80 % ◊ Self-ventilated motors (IC411) ◊ 2-, 4- and 6-pole motors <ul style="list-style-type: none"> » With starting capacitor: 0,12 kW up to 3,7 kW » With operating capacitor: 0,12 kW up to 2,2 kW ◊ 2- and 4-pole motors <ul style="list-style-type: none"> » With start and operating capacitor: 0,25 kW up to 3,7 kW
China Energy Label required for power range: 3-phase motors ≥ 0.75 kW ... ≤ 375 kW	
Exceptions	<ul style="list-style-type: none"> • Motors with mechanical commutators • Motors which are designed in such a way that they can be operated submerged in a fluid • Motors which are completely built into a product (e.g. a gearbox, a pump, a fan or a compressor), and where the energy efficiency of which cannot be recorded independently of that product • At altitudes exceeding 1000 m above sea level • At ambient temperatures above + 40° C • At ambient temperatures below – 15° C • Pole-changing motors • Motors especially designed for inverter duty • Non-ventilated motors (IC410) • Motors specially designed to drive special machines (e.g. high starting torque, special required torque stiffness and/or limit torque characteristics, a large number of start/stop cycles, and small rotor inertia)

India



Efficiency Standard	IS 12615: 2018
Efficiency Regulation	Gazette of India No. 3144/2018
Valid since	04/08/2018
Efficiency Requirement	IE2
Applicable for	<ul style="list-style-type: none"> • Single-speed, three-phase, 50 Hz cage induction motors • 2-pole, 4-pole, 6-pole and 8-pole motors • Nominal rated output power between 0.12 kW and 1000 kW • Nominal rated voltage U_N up to 1000 V • Continuous operation (S1 Mode) • Ambient temperature range – 20° C up to + 60° C • At altitudes up to 4000 metres above sea level • Geared motors • Brake motors
Exceptions	<ul style="list-style-type: none"> • Motors with mechanical commutators • Motors which are designed in such a way that they can be operated submerged in a fluid • Motors which are completely built into a product (e.g. a gearbox, a pump, a fan or a compressor), and where the energy efficiency of which cannot be recorded independently of that product • At altitudes exceeding 4000 metres above sea level • At ambient temperatures above + 60° C • At ambient temperatures below – 20° C (any motor) and/or at ambient temperatures below 0° C (air-cooled motor) • Slip-ring induction motors

South Korea



Efficiency Standard	KS C IEC 60034
Efficiency Regulation	MKE 2015-28
Valid since	01/10/2018
Efficiency Requirement	IE3
Applicable for	<ul style="list-style-type: none"> • Single-speed, three-phase, 60 Hz, induction motors • 2-pole, 4-pole, 6-pole and 8-pole motors • Nominal rated output power between 0.75 kW and 200 kW • 4-pole and 6-pole motors up to 375 kW • Nominal rated voltage U_N up to 600 V • Constant speed • Standard power/design size assignment • Torque curve according to NEMA A or B
Exceptions	<ul style="list-style-type: none"> • Motors with mechanical commutators • Motors which are designed in such a way that they can be operated submerged in a fluid • Motors designed for operating modes unlike S1 • At ambient temperatures above + 40° C • At ambient temperatures below – 15° C • Motors with integrated frequency inverter • Mains motor on frequency inverter when this is not implemented on a pump, fan or blower • Motors specially designed for inverter duty • Non-ventilated motors • Pole-changing motors

Japan



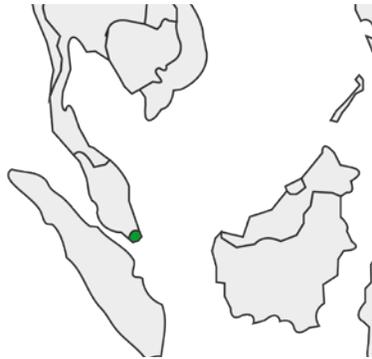
Taiwan



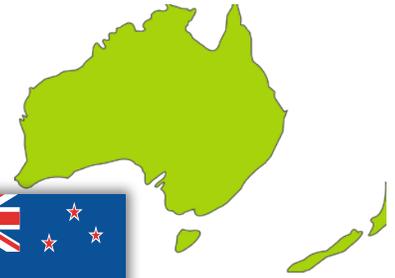
Efficiency Standard	JIS C IEC 4034-30
Efficiency Regulation	JIS C 4213:2014
Valid since	01/04/2015
Efficiency Requirement	IE3
Applicable for	<ul style="list-style-type: none"> • Single-speed, three-phase, 50 Hz, 60 Hz, induction motors • 2-pole, 4-pole, 6-pole motors • Nominal rated output power between 0.75 kW and 375 kW • Nominal rated voltage U_N up to 1000 V • Continuous operation S1 or S3 $\geq 80\%$ • Designed for mains operation • Geared motors • Brake motors
Exceptions	<ul style="list-style-type: none"> • Number of poles ≥ 8 • Insulation Class H and higher • Motors with mechanical commutators • Motors which are designed in such a way that they can be operated submerged in a fluid • At altitudes exceeding 1000 metres above sea level • At ambient temperatures above + 40° C • At ambient temperatures below – 20° C • Motors with integrated frequency inverter • Motors specially designed for inverter duty (motor with third-party ventilation) • Motors for explosion hazardous areas • Pole-changing motors

Efficiency Standard	IEC 60034-2-1
Efficiency Regulation	CNS 14400
Valid since	01/07/2016
Efficiency Requirement	IE3
Applicable for	<ul style="list-style-type: none"> • Single-speed, three-phase, 60 Hz, 50/60 Hz, induction motors • 2-pole, 4-pole, 6-pole motors • Nominal rated output power between 0.75 kW and 200 kW • Nominal rated voltage U_N up to 600 V
Exceptions	<ul style="list-style-type: none"> • Motors with mechanical commutators • Motors which are designed in such a way that they can be operated submerged in a fluid • Motors specially designed for inverter duty • Motors for explosion hazardous areas • Pole-changing motors • At ambient temperatures above + 40° C • At ambient temperatures below – 15° C

Singapore



Australia / New Zealand



Efficiency Standard	S602:2018
Efficiency Regulation	Energy Conservation Order 2017
Valid since	01/10/2018
Efficiency Requirement	IE3
Applicable for	<ul style="list-style-type: none"> • Single-speed, three-phase, 50 Hz, 50/60 Hz, induction motors • 2-pole, 4-pole, 6-pole motors • Nominal rated output power between 0.75 kW and 375 kW • Nominal rated voltage U_N up to 1000 V • Continuous operation S1, S3 \geq 80%, S6 and S9
Exceptions	<ul style="list-style-type: none"> • Motors with mechanical commutators • Motors which are designed in such a way that they can be operated submerged in a fluid • Motors which are completely built into a product (e.g. a gearbox, a pump, a fan or a compressor), and where the energy efficiency of which cannot be recorded independently of that product • At altitudes exceeding 4000 metres above sea level • At ambient temperatures above + 60° C • At ambient temperatures below – 30° C • Brake motors • Motors for explosion hazardous areas • Motors which will be exported again • Pole-changing motors

Efficiency Standard	IEC 60034-30-1
Efficiency Regulation	GEMS Act of 2018
Valid since	15/05/2019
Efficiency Requirement	IE2
Applicable for	<ul style="list-style-type: none"> • Single-speed, three-phase, 50 Hz, 60 Hz, induction motors • 2-pole, 4-pole, 6-pole, 8-pole motors • Nominal rated output power between 0.73 kW and 185 kW • Nominal rated voltage U_N up to 1100 V • All operating modes except S2 • Designed for mains operation • Geared motors • Brake motors
Exceptions	<ul style="list-style-type: none"> • Motors with mechanical commutators • Motors which are designed in such a way that they can be operated submerged in a fluid • At altitudes exceeding 4000 metres above sea level • At ambient temperatures above + 60° C • At ambient temperatures below – 20° C • Rotary field magnets and torque motors • Motors which are specially designed for inverter duty and for which only torques are specified on the rating plate • Motors which are intended for export • Pole-changing motors

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