



SIEMENS

When required, rugged & powerful –
but always dynamic & modern.

1LE1 low-voltage induction motors:
First choice for severe duty and general purpose applications.

Low-voltage motors

[siemens.com/1le1-motoren](https://www.siemens.com/1le1-motoren)

Value-added from every aspect: The 1LE1 motors series:

The demands placed on squirrel-cage motors are high and continually increasing: energy-saving, faster payback times and environmentally-friendly operation are requested. Our high-efficiency 1LE1 induction motors offer all of this. We have completely developed these motors in-house and manufacture them according to the most modern ecological perspectives.

The machine manufacturer, plant operating company and environment all benefit

Our compact motors for IE2 (High Efficiency) and IE3 (Premium Efficiency) set themselves apart as a result of their high-efficiency and their outstanding eco-balance over their complete lifecycle. It goes without saying that they fulfill the minimum efficiency requirements according to EU Regulation 640/2009

As the IE3 efficiency is up to 10% higher than that of IE1, the payback time for the increased costs for the high-efficiency version is reduced. You can calculate the energy saving by using the online energy saving calculator available under

www.siemens.com/energy-saving-calculator

Our 1LE1 motors are suitable for drive operations. In many applications, the combination of a high-efficiency motor and a drive can reduce energy costs by up to 70%. In many cases, this investment has a payback time between 6 and 24 months. You can simply determine the precise energy-saving potential for your pump, fan or compressor application using our SinaSave software available under

www.siemens.com/sinasave



The latest technologies for high quality

The new series of 1LE1 motors is one of the most compact in the world because we employ innovative production technologies. To achieve an optimum design, we have developed a new rotor that uses a combination of highly conductive materials. This novel approach minimizes the rotor losses and provides the motor with excellent behavior when starting and during switching operations. We also place special emphasis on an environmentally and production friendly process.

For instance, the winding impregnation and surface paint that we use are solvent-free.

One motor platform for the global market

Thanks to the standard platform concept, the widest range of local efficiency regulations from around the world can be flexibly complied with. In addition to the 1LE1 for the European Economic Area, we have our 1LE0 for the Asian market and the 1LE2 series for the NAFTA market. Further, the family of 1LE1 motors offers export lines for the machinery construction sector, e.g. for the NAFTA market.

Equipped for the demands of tomorrow

Motors in the power range from 750 Watt to 375 kW are classified according to efficiency classes in compliance with IEC 60034-30. From June 16, 2011, IE1 motors in compliance with EU regulation 640/2009 are no longer available from motor manufacturers for the European Economic Area. Machine manufacturers must change over to IE2 or IE3 motors. Our 1LE1 motors make this changeover especially simple – as a result of their especially compact design and the fact

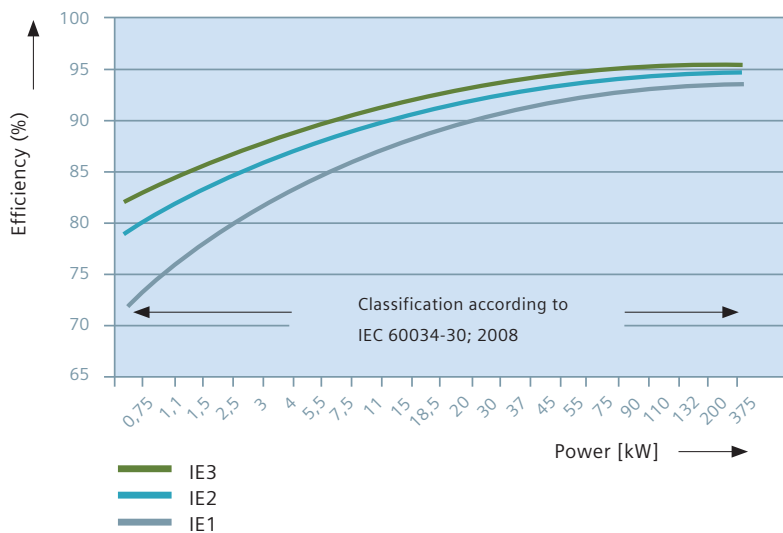
that the efficiency classes often have identical dimensions. When changing over to a higher efficiency class, the mechanical interface to the driven machine remains the same. Additional advantages of our 1LE1 motors: their long service life and their low weight, which has a positive impact on the statics of the overall machine.

Well conceived design for maximum flexibility

The design and architecture of 1LE1 motors ensures the maximum degree of flexibility and minimum costs when mounting and installing: Users benefit from the integrated eyebolts, bolted-on mounting feet (optional version), reinforced bearing shields with optimum mechanical properties and a terminal box that is easy to access. These are diagonally split and can be rotated; for the two smallest shaft heights, even continually through 360°. Not only this, encoders, brakes and external fans can be easily added. With the low number of different parts, stocking is also simplified, which is why motor distributors are able to respond more quickly to customer requirements.

Leading partner in automation and drive technology

However, with all of this innovation and new features, well-proven aspects of our family of 1LE1 motors have been kept. The best example: our reliable service – locally around the world, in more than 130 countries. As technology leader, we can offer you products and systems that are perfectly coordinated with one another across the board – from the motor up to the control system, everything from a single source.



Encoders, brakes and external fans can be easily added.

For general-purpose applications: Motors with aluminum housing



1LE1 motors with aluminum housing are suitable for a wide range of standard drive tasks in the industrial environment. As a result of their especially low weight, they are predestined for pump, fan and compressor applications. They are also very well suited for conveyor systems and hoisting devices.



Terminal box that can be rotated through 360°. For FS80 and FS90, with preconfigured terminal board

Minimum costs through a compact design

For efficiency classes IE1 and IE2, the well-proven 1LE1 motors from FS100 to 160 share a common housing. This significantly simplifies the introduction of the minimum efficiency in Europe, as the changeover to a higher efficiency doesn't necessarily mean a machine redesign. In some cases even motors with Premium efficiency (IE3) use the same housing as the high-efficiency motors. It is always guaranteed that the mechanical interface to the driven machine always remains the same.

Especially user-friendly

The well-proven terminal box introduced for frame sizes 100 to 160 is consequentially used over the complete motor series. The 2 and 4-pole motors, frame sizes 80 and 90 go even one step further: With these motors, the terminal box is fixed using just one screw and can be

continually rotated through 360 degrees. Also the terminal box is preconfigured with a terminal board. When space is restricted, this simplifies and significantly shortens installation times as the motor connecting cable can be fed in from any direction.

Special export line

The Eagle Line is available for export to NAFTA. The motors are shipped with the electrical values according to EISA/CSA specifications stamped on the rating plate.

More power

Motors with increased output power can be the solution if the motor has to be very compact and the space is not sufficient for a standard motor. Using these motors in efficiency class IE2 the power ratings of a standard motor can be implemented in the next smaller shaft height.

Data, facts, details – 1LE10 General Purpose motors

Frame size	80 to 160	
Power range	0.55 kW to 22 kW	
Pole number	2/4/6/8	
Motor material	Frame: Aluminum, terminal boxes: Aluminum Fan cover: Plastic	
Efficiency classes	IE1 = Standard Efficiency IE2 = High Efficiency IE3 = Premium Efficiency	NEE = NEMA MG1 Table 12-11 Energy Efficient Motors NPE = NEMA MG1 Table 12-12 Premium Efficient Motors
Versions	> Standard motors in IE1, IE2 and IE3 > Increased Power Line: motors with increased output power in IE2 with one standard power increment higher	> NAFTA Export Line (Eagle Line) in NEE and NPE > Force ventilated without external fan and fan cover > Non-ventilated without external fan and fan cover
Marking	Classification according to DIN IEC 60034-30: IE1, IE2, IE3, 2, 4, 6-pole	
Degree of protection	IP55	
Voltages	All of the usual voltages	
Frequency	50 Hz and 60 Hz	
Type of construction	All of the usual types of construction	
Temperature class	155 (F) utilized to 130 (B)	
Insulation system	DURIGNIT® IR 2000, inverter proof up to a rated voltage of 460 V	
Modular mounting concept	Rotary pulse encoder, brake, external fan – or prepared for mounted components	

For severe duty applications: Motors with cast iron housing



1LE1 motors with cast iron frames are especially rugged and therefore the first choice for applications in harsh environments. They can master dust or vibration in crushers and mixers as well as aggressive atmospheres found in the petrochemical industry. Their design optimally supports motor cooling and offers the same ease of handling as the general purpose versions. The diagonally split terminal box permits simple access to the terminal board for fast installation and wiring.



With cast iron housing: ideal for use under harsh environmental conditions

The optimum motor for various demands

The following lines are available for severe duty applications:

- **Basic Line:** rugged, reliable motors for machinery construction
- **Performance Line:** motors for the process industry with reinforced bearings and a tougher paint finish – for requirements that go beyond the Basic Line
- **Eagle Line:** Motors for use in NAFTA; they comply with ULR and CSA requirements and are supplied with efficiencies according to EISA specifications. The same also applies here: The 1LE1 family offers solutions to address the widest range of requirements around the world.

For machines, frequently the size of a motor plays a decisive role. This is the reason that the 1LE1 motors in IE2 and IE3 are as long as or even shorter compared to the 1LG series. An additional highlight: In some cases the IE3 motors fit into the same frame as the motors with IE2 efficiency. It goes without saying, that the efficiency classes do not differ regarding their shaft height; as an advantage, the mechanical interface to the driven machine always remains constant. In turn, this makes it easy to upgrade the efficiency to IE3 – without having to adapt the mechanical design of a machine.

More power

Also in severe duty applications, motors with increased output power can be the solution if there is not enough space for a standard motor. This is because these motors offer the same power rating in the next lower shaft height.

Compact design

Data, facts, details – 1LE15, 1LE16 Severe Duty motors

Frame size	100 to 315	
Power range	0.75 kW to 200 kW	
Number of poles	2/4/6/8	
Motor material	Frame: cast iron, terminal box: cast iron fan cover: plastic or sheet steel (depending on the version)	
Efficiency classes	IE2 = High Efficiency IE3 = Premium Efficiency	NEE = NEMA MG1 Table 12-11 Energy Efficient Motors NPE = NEMA MG1 Table 12-12 Premium Efficient Motors
Versions	> Basic Line in IE2 and IE3 > Performance Line in IE2 and IE3	> Increased Power Line: motors with increased output power in IE2 with one standard power increment higher > NAFTA Export Line (Eagle Line) in NEE and NPE
Marking	Classification acc. to DIN IEC 60034-30: IE2, IE3, 2, 4, 6 pole	
Degree of protection	IP55	
Voltages	All of the usual voltages	
Frequency	50 Hz and 60 Hz	
Type construction	All of the usual types of construction	
Cooling type	Surface cooled (TEFC)	
Temperature class	155 (F) utilized to 130 (B)	
Insulation system	DURIGNIT® IR 2000, inverter proof up to a rated voltage of 460 V	
Modular mounting concept	Rotary pulse encoder, brake, external fan or prepared for mounted components	
Standard concept of the series	Cast frame mounting feet, bolted as option and can be retrofitted, terminal box is diagonally split and can be rotated through 4 x 90°, DE and NDE bearings are the same, optional bearing size 63	

You can find additional information on our industrial drive portfolio in the Internet:

Motors

www.siemens.com/lowvoltagemotors
www.siemens.com/gearedmotors

Drives

www.siemens.com/sinamics

Efficiency classes for low-voltage motors

www.siemens.com/international-efficiency

Energy-efficient production and energy management

www.siemens.com/energysaving

Tools

www.siemens.com/dt-configurator
www.siemens.com/energy-saving-calculator
www.siemens.com/sinasave

Contacts

www.siemens.com/automation/partner

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