

Exporting AC electric motors to Europe

Europe is a large market for alternating current motors. Germany is the largest importer, followed by Italy, France and the Netherlands. From the perspective of a developing country, China is a very strong and price-competitive supplier, dominating supplies of AC motors to Europe. The best opportunities for exporters from developing countries are in the export of motors in the range of 0.75-22 kW. However, this range also boasts most competition, so its margins will be the lowest.

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1. Product description

AC motors are electric motors that are driven by an alternating current (AC). They consist of two basic parts: the one is an outside stationary stator with coils that are supplied with alternating current to produce a rotating magnetic field, while the other is an inside rotor attached to the output shaft that is given a torque by the rotating field. There are also electric motors driven by a direct current (DC). However, these motors are not covered here, as DC motors are not commonly produced in developing countries.



AC motors are used in all kinds of electrical machinery and installations, ranging from agricultural machinery or lifting and handling equipment to machine tools. Some common applications are pumps and fans, turbines, drills, conveyor belts, computer hardware, white goods and household appliances.

When AC motors are referred to in this survey, this concerns the following [Harmonised System](#) codes, unless stated otherwise:

- 85014020 - AC motors, single-phase, of an output of >37.5 W but ≤ 750 W,
- 85014080, 85014091, 85014099 - AC motors, single-phase, of an output of >750 W,
- 85015210, 85015220 - AC motors, multi-phase, of an output of >750 W but ≤ 7.5 kW,
- 85015230 - AC motors, multi-phase, of an output of >7.5 kW but ≤ 37 kW,
- 85015290, 85015291, 85015293, 85015299 - AC motors, multi-phase, of an output of >37 kW but ≤ 75 kW.

Product specification

Specifications of AC motors as required by European buyers are described below. Furthermore, pictures 1-2 show some examples of AC motors sold in the European market.

Picture 1: 11 kW AC Motor 4 Pole (1500 rpm) Teco LVED, IE2, B3 Foot Mounted, Aluminium Construction, Frame Size D160M	Picture 2: 3 kW AC Motor 2 Pole (3000 rpm) IE2 3 Phase, Type HJN 100L-2
	

Material and design

AC motors are made of different components. The components' quality and the construction material of the motor body have a strong impact on the expected life of the motor. In addition, there are some specific key elements that will certainly prolong motor life. Bearing failure is by far the most common cause of AC motor failures, with approximately 60% of all motor failures being attributed to failed ball or roller bearings.

Bearing failure in AC motors is rarely caused by fatigue, as life for a bearing in this particular setting is relatively easy. However, the most common cause of bearing failure is through insufficient or contaminated lubrication. Therefore, many machinery and equipment builders and end-users in Europe specify a high-quality bearing (often by brand) and a lip seal of above average quality. One could even say that the reputation and performance of the imported motor therefore rests on the quality of these two components.

Quality

The main factors determining the technical quality of the motor are:

- Bearing quality (also see above),
- Impregnation of the windings, as different applications can sometimes require a variation to the insulation,
- Visual quality. This means that not only the inner body of the motor should be of good quality; the outside of the motor should also be attractive.

Tips:

You should ensure a very good bearing quality, as there is a high probability that buyers will ask which brand of bearing (and sometimes also which seal brand) is used. The answer to that question can heavily influence the purchasing decision.

Make a detailed offer that pays attention to all specifications of the buyer. In most cases, the buyer will provide a document with very detailed specifications: quality, materials, deviations, quantity, delivery date, and more. It is strongly advisable to compose your offer according to these requirements. You may well be asked to provide first article inspection reports with the sample.

Labelling and packaging

The AC motor packaging consists of a carton or a wooden box, depending on the size of the motor. The outer package should contain the brand name and type number. The package for ocean transport is a wooden, iron or plastic pallet, wrapped in plastic sheeting and packaged with metal strips.

The size of the boxes depends on the weight per box and the handling possibilities. Moreover, it may well be the case that the customer maintains specific or additional packaging requirements and preferences. It is common that specific packaging requirements, such as individual box packaging, are provided upon request.

Tip:

Regarding the packaging, the requirements are often provided by the customer. If this is not the case, you should ask what they would prefer. You have to take care to provide the right amount of packaging, not too little but also not too much, since it is expensive to dispose of packaging in Europe.

2. Which European markets offer opportunities for AC motors?

Imports

European imports of AC motors increased by 2% on average per year between 2011-2015 to €4.2 billion in 2015. AC motors were mostly imported from countries within Europe. However, the import from developing countries showed the largest growth in the past four years (6% per year on average). The import share of developing countries increased from 18% to 22% over four years' time.

For the coming years, the share of developing countries is forecast to grow to 24%, as European importers are expected to buy more competitively priced motors from manufacturers in developing countries.

Germany is the largest importer of AC motors, followed by Italy. The import from developing countries was the highest in Italy (€205 million), followed by Germany (€196 million) and the Netherlands (€101 million). Of these countries, Italy showed the highest absolute growth (€64 million) in AC motors import from developing countries. The import of AC motors is expected to show some growth in the next few years, in the range of 0-3% per year. This growth is caused by an ongoing globalisation of production, which leads to more trade between countries, and by ongoing strong demand in Europe.

Leading suppliers

Germany, China and Italy are the leading suppliers of AC motors. Together, they represented 48% of the total European imports amounting to €4.2 billion in 2015. Other main suppliers are France (8% share), the Czech Republic (6%) and Poland (5%). Of these countries, Poland showed the highest annual growth over four years' time (23%), followed by China (8%). Poland's growth is caused by the fact that the country attracted Foreign Direct Investments in production facilities from important European motor manufacturers in the past decade.

China is the largest supplier from developing countries (€606 million). Other AC motors suppliers from developing countries are Tunisia (€136 million) and Brazil (€103 million).

In the AC motors industry, China is not really considered to be a developing country anymore. This is because Chinese motor exporters have invested in specialisation at a level competitive with the Germans. Besides, engineers generally accept that Chinese products are good. However, these will always be perceived as a second-grade product when compared to motors from the European brands [ABB](#) or [Siemens](#), even though both are manufactured in China.

Tips:

Benchmark your company against your peers from China, Tunisia and Brazil, as well as those from Germany, Italy, France and the other top supplying countries of AC motors to Europe. One source that could be used to find exporters of AC motors per country is [ITC International Trade Statistics](#) (for which you have to register first).

The best opportunities for exporters from developing countries are in the export of AC motors in the range of 0.75-22 kW. In this range, there are relatively few specific requirements that could apply and, therefore, the motors in this range are relatively standard. This range is also the most competitive, however, so its margins will be the lowest.

The Original Equipment Manufacturers (OEM) market is the largest market in Europe. This market segment is characterised by high brand awareness. Exporters from developing countries who want to penetrate this market therefore need to (co-)invest in marketing and awareness campaigns.

You can also use [Eurostat](#) to obtain detailed trade statistics about the industry.

You can find relevant trade fairs in trade fair databases such as [Eventseye](#). The most important trade fair for you is [Hannover Messe](#). A dedicated fair on MDA (Motion, Drive & Automation) is part of the Messe every odd year. Other fairs are [Drives and Controls](#) and [Subcon](#) (the United Kingdom); [HI Industry](#) (Denmark); [Eliaden](#) (Norway) and [Teknologia](#) and [Subcontracting](#) in Finland.

[Commisceo Global](#) offers a lot of information about differences in business cultures and etiquette. You should pay some attention to this aspect before you start exporting to Europe.

Exports

The total European exports of AC motors increased by 2.0% per year between 2011-2015 to €5.2 billion. Exports of European AC motors were mainly destined for other European countries. However, the export to developing countries showed a higher annual growth (4.0% every year on average). In 2015, European export to developing countries amounted to €875 million, 17% of the total European exports. For the coming years, this share of developing countries is forecast to remain relatively stable around 15-18%.

Germany is the largest European exporter of AC motors (€2.0 billion in 2015, 41% of the total European exports), followed by Italy (13% share) and France (10%). Other important exporters were the Czech Republic (8% share), Poland (5%) and the Netherlands (4%). German exports to developing countries are relatively large, representing nearly 60% of European exports to developing countries. European exports of AC motors are expected to continue to grow over the next few years, at a rate of around 2-4% per year.

Production

Production of AC motors in Europe totalled €6.0 billion in 2014, following an average annual increase of 1.8% between 2010-2014. After reaching a peak of almost €6.4 billion in 2011, the European production decreased to €5.9 billion in 2013. Germany is the largest producer of AC motors in Europe (37%), followed by Italy (13%) and Finland (12%).

While German output increased considerably between 2010-2014 (by €263 million), Italian output declined by €121 million. Obviously, the German industry performed strongly while the Italian industry faced some difficulties, reflected by their respective demand for and production of AC motors. In addition to Germany's strong performance, the Central and Eastern European countries of Poland, Hungary and the Czech Republic registered considerable growth. To some extent, this growth was the result of production relocations from western and southern European countries (mainly Italy and France) to this region.

Tip:

Apart from Germany, there is also considerable production output in Italy and Finland. The presence of producers in these countries offers subcontracting opportunities to exporters from developing countries.

Demand

European demand totalled €5.0 billion in 2014, following a small average annual increase of 0.4% between 2010-2014. The demand showed a peak of €5.6 billion in 2011. Note that the weak overall performance was mainly caused by the decline in Italy's market (by €146 million or 3.0% on average). Without Italy, European apparent demand increased by an average 1.4%.

Germany and Italy are the largest markets for AC motors. Together, they represented 49% of the total European market. Other countries with high demand are France (12% share), Spain (5%), Poland (5%) and the United Kingdom (4%). Of these countries, Poland showed the highest annual growth on average (2.7%) between 2010-2014.

3. What trends offer opportunities on the European market for AC motors?

The main trends in the AC motor market are about energy efficiency and availability. Furthermore, the AC motor production and supply chain is characterised by ongoing consolidation. For more information, see our study of [trends on the European AC motors market](#).

Energy efficiency in AC motors

Much of the electricity generated in Europe is used to drive AC motors. It is therefore clear that more efficient AC motors can have a very large impact on energy consumption. To stimulate the use and development of efficient motors, the European Commission has set regulations for mandatory minimum efficiency standards for industrial AC motors called the [Minimum Energy Performance Standard](#) (MEPS) scheme.

This efficiency scheme is being introduced in three stages between 2011 and 2017, and covers most single-speed, three-phase induction motors up to 375 kW. The new scheme has prohibited the sale of motors below standard International Efficiency IE2 (comparable to the former EFF1 standard) from June 2011 onwards. As a result of the MEPS, the imports of AC motors into Europe will be limited to highly efficient IE3 motors for certain smaller applications (in the range of 0.75-7.5 kW) from 2015, and for all applications from 2017. As an alternative, IE2 motors can be sold after 2015 if they are used together with a variable-speed drive.

The MEPS scheme has had quite an impact on the European market because, before the prohibition of IE1 motors a few years ago, the penetration of energy-efficient motors was relatively low.

Strong price competition

Several AC motor producers and distributors across Europe report a high pressure on prices. End-users of AC motors increasingly demand lower prices, while on average the improved (more energy-efficient) motors have a higher price level than before. Coupled with the difficult market situations across the world (for example in China), this development forces suppliers to compete strongly on price.

Availability

In recent years, AC motor manufacturers have rationalised and reduced both their stock profiles and their stock

levels. Distributors responded to this development by widening their range of stock products and increasing stock levels. As lead time is one of the key drivers for many of their customers, distributors have invested considerably in their inventory service level.

Industry consolidation

Over the past 20 years, the AC motors industry has changed a lot as a result of several acquisitions. These acquisitions not only involved production locations in Central and Eastern European countries (almost always by multinational producers), but they also involved locations in other European countries such as the United Kingdom.

Brook Crompton, a UK company involved in several mergers/acquisitions, is nowadays part of a Chinese holding. Baldor, a company from the USA which was another main player in the European electric motor market, was acquired by ABB from Switzerland. Some very recent acquisitions are WEG's takeovers of German AC motor manufacturers Württembergische Elektromotoren and KATT, and the takeover of the Finnish producer Vacon by the Danish company Danfoss (involving AC drives rather than motors).

Premium products

There are a number of suppliers of AC motors in Europe, several of which offer premium brands such as ABB and Siemens. Their presence makes the level of competition quite high. Such motors are technologically advanced and offer advantages such as higher efficiency, reliability in performance and whole-life cost savings. This product development, along with inbuilt technical advantages, aims to offer a distinct product differential from AC motors exported from developing countries.

Adding value

As AC motors are often quite similar technically, many suppliers are trying to distinguish themselves from the competition by adding value to their product offering. This is increasingly achieved by offering after-sales services (various types of customer support) via distributors, as well as by improving the reliability (for instance, bearings, seals, copper content) and environmental credentials of the product.

In order to be competitive on the European AC motors market, exporters from developing countries should take these factors into consideration. When choosing trading partners, exporters from developing countries should also take into account the quality of services that distributors provide to their customers. This can be an important way of increasing customer loyalty to your brand in this competitive market.

Tips:

Quality, price and reliable delivery are the major criteria for customers in the supplier selection process. As the producer of the motor, the producer from a developing country can have a great deal of influence on the first two issues, while delivery reliability is a shared responsibility of both the producer from a developing country and the European trade partner.

You must be prepared to be transparent and to provide quick communication with distributors. Participation in an online inventory monitoring system, and possibly a consignment stock arrangement, will help to keep inventories as low as possible.

You should respond to the trend of energy efficiency in AC motors, even if the MEPS scheme does not affect your product range.

You must be prepared for the new efficiency schemes. In addition, the IE class and efficiency values need to be printed both on motor rating plates and in product documentation material.

4. What requirements should AC motors comply with to be allowed on the European market?

Requirements can be divided into (1) legal requirements, which you must meet in order to enter the market, and (2) non-legal requirements, which most of your competitors have already implemented; in other words, which you need to comply with in order to keep up with the market. See our study of [EU buyer requirements for motion control](#) for a general overview of requirements. Below are the requirements that apply specifically to AC motors.

Legal requirements

CE marking

Four different European directives apply to AC motor design and production for CE marking. The directives address mechanical requirements, electromagnetic disturbances, electrical risk and energy use, respectively.

- CE marking: Machinery ([Directive 2006/42/EC](#)). This directive describes machine requirements for operator safety and health. It is related to AC motors as basic components of machines. The AC motors must be declared compliant by their manufacturers.
- CE marking: Electromagnetic Compatibility ([Directive 2004/108/EC](#)). The EMC directive applies to AC motors as an appliance liable to cause electromagnetic disturbances or that may have its normal operation affected by such disturbances.
- CE marking: Low-Voltage Equipment ([Directive 2006/95/EC](#)). This directive covers the safety of people handling products using voltages in the range of 50 VAC to 1000 VAC or 75 VDC to 1550 VDC. It applies to AC motors as components designed for use within this voltage limits.
- CE marking: Energy-Using Products Directive ([Directive 2009/125/EC](#)). In relation to the Ecodesign Requirements in this Directive, some important changes will come into force in the coming years. New regulations require that, from June 2011 onwards, all AC motors must meet the IE2 standard. From 2015, motors of 7.5 kW to 375 kW must fulfil either IE3 or IE2 and use an electronic drive. By 2017, these requirements will be extended to all AC motors in the range of 0.75 kW to 375 kW.

Standards

The Directive on the Restriction of Hazardous Substances (RoHS or [Directive 2002/95/EC](#)) restricts the use of certain hazardous substances in electrical and electronic equipment.

Note that the compliance of a complete installation with the “Machinery Directive” and the Electromagnetic Compatibility (EMC) Directive is the responsibility of the machine or equipment manufacturer.

For AC motors in very specific applications, such as in a potentially explosive atmosphere, specific directives may apply. In the case of the example mentioned, the AC motor must meet the [ATEX Directive](#) (Directive 94/9/EC).

Another important standard is the directive on liability for defective products ([Directive 85/374/EEC](#)). The Product Liability Directive states that the European importer is liable for the products put on the European market. The European importer, however, can in principle pass on a claim to the producer/exporter.

Packaging

For wood packaging materials used for transport, including dunnage ([Directive 2000/29/EC](#)), please note that Europe sets requirements for materials such as packing cases, boxes, and so on.

Another packaging-related directive is the general directive about [packaging and packaging waste](#). This directive prescribes the marking of the kind of packaging material used and the maximum levels of heavy metals in the packaging material.

Duties

For AC motors, a [2.7%](#) duty is levied on European imports from third countries. All countries may benefit from a

preferential 0% tariff; for example, Turkey, Tunisia and all least developed countries (under the GSP arrangement Everything But Arms (EBA)). Note that it is only possible to claim a preferential tariff treatment with a Certificate of Origin.

Tips:

As most manufacturers from developing countries produce motors that are classified as EFF2 motors, it is very important that they now make their motors more efficient in order to meet the stricter requirements in the European market.

Many global motor manufacturers now offer low-voltage AC motors both in IEC and NEMA design, according to the various Minimum Energy Performance Standards and complying with energy-saving programmes and schemes worldwide. Developing Country producers should follow this trend also design their AC motors according to this standard as well.

Non-legal requirements

Buyer's specifications

Customers' main requirements will be related to the price, as the legislation in place makes the technical requirements relatively uniform. This does not mean that product quality is not an issue, as customers do have requirements; for instance, related to the visual quality, the ease of use, the ease of handling (the motor in the box) and more. Of course, customers also have specific, individual requirements related to delivery conditions, technical backup services and payment terms, for example.

Last but not least, customers may have requirements for the product range or width. Obviously, this starts with efficiency categories (IE2, IE3, for example) and the closely related matter of the frame material (aluminium or cast iron). Other product range requirements can be related to mounting methods, protection classes, voltages, frequencies and specified "add-ons", such as the use of sensor technology for winding temperature and bearing temperature detection. Other motor types that are sometimes required include single-phase, HV, brake, explosion-proof (EExd, EExde) and slip-ring.

Tips:

Usually, there are no major technical or contractual reasons that would prevent customers from switching between different suppliers. However, be aware that customers apply systematic qualification procedures when selecting a supplier.

It is important to be able to offer the full range of mounting methods (B3, B35, B5, B14, B34, and V1) and protection classes (IP54, IP55, and IP23). However, to meet the needs of specific customers, you may need to offer different voltages, frequencies and protection classes (IP65, IP56).

See our [10 tips for doing business with European buyers of motion, drives, control and automation](#) and our [10 tips for finding buyers in the motion control sector](#). These tips also offer more information on which topics are decisive for European buyers when searching for (new) suppliers.

You can use the [EU Export Helpdesk](#), the [ITC Market Access Map](#) and the [ITC Standards Map](#) for more information on gaining access to the European market.

5. Through what channels can you get AC motors on the European market?

Importers play a key role in the trade of AC motors. Most importers keep a large stock in order to secure on-time delivery, which is essential in replacement situations. Most importers sell a wide range of AC motors, with variations in power as well as in shaft, sealing and winding configuration. They may often multi-source from more than one manufacturer of motors. For more information, see our study of [Market Channels and Segments for AC motors](#). A few examples of prospects are given below, categorised by the main groups of companies in the trade channel landscape. For further clarification, two European regions, (1) the United Kingdom and Ireland and (2) the Nordic countries of Denmark, Finland, Sweden, Norway, have been taken to explain these groups of companies.

Trade channel landscape in the United Kingdom and Ireland

- [Brammer](#) and [Eriks](#) are among the market leaders in distribution in the United Kingdom. They offer a broad range of motion control products. Some other generalists include [Hayley Group](#), [BRT Group](#) and [Acorn](#). Broad line importers/distributors in Ireland are [Reliance](#) and [Dickson Bearings and Transmissions](#).
- Some importers/distributors have specialised in AC motors and associated products, such as [Wilson Electric](#), [Camis Motors and Drives](#), [Kenworth](#), [Medway](#) and [Tec Motors](#) in the United Kingdom.
- Rewinders or electrical equipment repair companies can be also considered as importers/distributors of AC motors. Examples in the United Kingdom are [Deritend](#), [Taylor and Goodman](#), and [Anstee and Ware](#), as well as [Eriks](#). Examples in Ireland are [Electrical Rewind Services](#), [Avonmore Electrical](#) and [Associated Rewinds](#).

Trade channel landscape in the Nordic countries

- Several importers/distributors operate in the whole Nordic region and some also cover the Baltic States. Examples are [Brammer](#), [Svend Hoyer](#) and [Mekanex](#).
- Denmark: Importers/distributors include [Brammer](#), [Brd. Klee](#), [Teknatex](#), [Eegholm](#), [Dani-Tech](#) and [Dutchi](#).
- Finland: Importers/distributors include [Brammer](#), [Lst Group](#), [Kraftmek Oy](#), [SKS Mekaniikka Oy](#), [Movetec](#), [Vuorenmaa Yhtiöt](#), [Hautalan Sahkomoottori](#) and [Finndrive](#). Finland is home to a few motor manufacturing plants. One is owned by the Swedish giant [ABB](#), the other belongs to pump and motor manufacturer [Kolmeks](#).
- Norway: Importers/distributors include [Brammer](#), [Transtech](#), [Elfa Distrelec](#) and [Rekvisitt](#).
- Sweden: Importers/distributors include [Brammer](#), [Sverull AB](#), [Adigo Drives](#), [Regal](#), [Mekanex](#), [Agera Industritillbehör](#), [Akron](#) and [EIE](#). Sweden is the historical home of [ABB](#), one of the world's giants in power and automation solutions including AC motor production. The other Swedish producer is [Bevi](#).

Tip:

For additional information on finding buyers, see our study of [Finding Buyers in the Motion Control Industry](#). Our study of [Doing Business in the Motion Control Industry](#) may also be interesting to you.

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