



CBI  
*Ministry of Foreign Affairs*

# **CBI Product Factsheet:**

## **Relays in Germany**

## Introduction

Germany's electrical and electronics sector is developing positively, and it is benefiting from its export orientation. Manufacturers in the automotive industry have a demand for resistors, as do their counterparts in other industrial sectors (e.g. energy, industrial automation). These companies are constantly striving to optimise their supply, thus opening opportunities for exporters from developing countries. Although there is a demand for cost-efficient solutions, these solutions must meet the prevailing quality requirements.

## Product Definition

Relays are electrically operated switches. Many relays use electromagnets to operate switches mechanically, although other operating principles are used as well (e.g. solid-state relays). Relays are used in applications in which it is necessary to control a circuit through a low-power signal, or in which several circuits must be controlled by one signal. The following types of relays are typically sold in Europe:

- Relays for voltages  $\leq 60V$ , for currents  $\leq 2A$  (HS code 85364110),
- Relays for voltages  $\leq 60V$ , for currents  $> 2A$  (HS code 85364190),
- Relays for voltages  $> 60V$  but  $\leq 1,000V$  (HS code 85364900).

Relays are used as part of electrical circuits in many common electrical devices and in many industries, including industrial, automotive, medical technology, laser or robotics.

Product quality and design are the most important factors determining successful market entry. Premium brands have a competitive edge. For this reason, industrial users may prefer established brands, although they are not essential to market success. The leading suppliers of relays include: [Elesta](#), [Hongfa](#), [Phoenix Contact](#), [Schneider Electric](#), [STPI Group](#) [TE Connectivity](#).

## Product Specifications

**Quality:** Supplying companies should focus on relays that fulfil the current market requirements.

- Relays differ in terms of specifications, and they can be classified according to the materials, shape or performance used.
- Market requirements for relays include:
  - design;
  - flexibility;
  - individuality;
  - smart relays.
- The materials used, especially hazardous substances, must comply with RoHS, and they must fulfil the REACH requirements. In addition to these two requirements, products must comply with all other relevant EU directives (see below).

### **Labelling:**

- Relays are marked with the description of content, including the following types of information:
  - type of product;
  - model type;
  - supplier/manufacturer name;
  - supplier/manufacturer location;
  - serial number.

### **Packaging:**

- Relays are usually packaged in plastic bags and cardboard boxes.

## Legislative Requirements

Compliance with European legislative and non-legislative requirements is a basic necessity for all exporters in the electronics and electrical engineering sector. These measures are intended to ensure the quality and reliability of products. The most important requirements that apply to your products are discussed below. Be sure that you are familiar with the applicable legal requirements with regard to labelling, hazardous substances, product safety and liability. Your products must comply with all EU directives.

**Liability for defective products.** The liability applies to all products manufactured or imported into the European market. Although the company that brings the product onto the European market is usually responsible, claims can be passed along to producers or exporters.

**Tip:**

- Be familiar with standards that apply specifically to your products. To ensure that your products are of high quality, review your quality assurance and testing procedure (e.g. by implementing an accredited quality management system; ISO 9001). Formulate labels, instructions for use and disclaimers carefully. Finally, be sure that your insurance covers product liability. Additional information is available in the document on EU legislation: [Liability for defective products](#). Another resource is the [ITC standards map](#).

• **CE marking.** As components, relays are typically sold to equipment manufacturers. With a few exceptions, relays must be marked with the CE mark. Relays that are sold within assemblies, sub-assemblies or finished goods are not legally required to bear a CE mark. Driven by market requirements, however, nearly all customers continue to demand the CE mark for most components, particularly those that are critical to the application. The following directives may be relevant for relays:

- Electromagnetic compatibility (EMC Directive 2004/108/EC),
- Low-voltage equipment (LVD 2006/95/EC),
- Eco-design for Energy-related products (Directive 2009/125/EC),
- Equipment for use in a potentially explosive atmosphere (ATEX Directive 94/9/EC),

Restriction of the use of certain hazardous substances in electrical and electronic equipment (RoHS Directive 2002/95/EC). Additional information is provided below.

**Tips:**

- [Apply for CE marking](#), which is required by many customers, even if your product is a sub-system or part of a finished good and is thus not legally required to bear a CE mark. If you are a manufacturer, you should be familiar with the process of affixing the CE marking to relays. The [European Commission's](#) insightful website 'Export Helpdesk' illustrates the key steps to take from the beginning to the trading of the product. The following documents provide additional information on EU legislation:
- [CE marking for Electromagnetic compatibility](#)
- [CE marking for Low-Voltage Devices](#)
- [CE marking for Eco-design of energy-related products](#)
- [Directive 94/9/EC \(ATEX\)](#)

**Waste of Electrical and Electronic Equipment (WEEE).** If you are considering exporting electronic or electrical products to the EU, you be aware that EU buyers have obligations regarding the waste of these products. Producers in the EU are obliged to participate in product take-back schemes. Although this does not directly affect exporters from developing countries, such requirements may have an impact when EU buyers ask their suppliers to meet specific design requirements or provide certain information.

**Tip:**

- Ensure that your product design complies with WEEE and enables product recycling, recovery or dismantling (note that these requirements may differ from one EU Member State to another). Formulate labels carefully, and mark products in accordance with WEEE (e.g. the symbol of the crossed-out wheeled bin). Obtain additional information on the EU legislation concerning [Waste Electrical and Electronic Equipment \(WEEE\)](#).



**Labelling of energy-related products.** Producers and exporters in the EU are obliged to indicate energy consumption by household appliances and other energy-related products (the list is being extended to include products used for industrial purposes. Be sure to check this when importing your products, and discuss it with your European customers).

**Tip:**

- Indicate all product details (e.g. energy class, performance, capacity) required by the EU. Consult the EU legislation on energy labelling for energy-using and energy-related products on the [EU website](#).

The **REACH regulations** are intended to manage risks relating to chemicals and to provide safety information on such substances. This legislation restricts the use of certain hazardous chemicals. It also established requirements regarding information on chemicals that have been used. Manufacturers are required to provide buyers with information on the properties of any chemical substances used.

**Tip:**

- Ask your buyers about their requirements regarding [REACH](#). List all chemicals, including raw materials and additional materials, used in your production process.

**Restriction of the use of certain hazardous substances in electrical and electronic equipment (RoHS).** The directive bans the placing on the EU market of electrical and electronic equipment containing more than the agreed levels of lead, cadmium, mercury, hexavalent chromium, polybrominated biphenyl and polybrominated diphenyl ether flame retardants.

**Tip:**

- Be sure that none of the hazardous substances referred to in the RoHS Directive is used in your production process. Exporters of electronic components are required to meet the standards specified under both the RoHS and the REACH directives, as they are complementary. The EU legislation on the Restriction of Hazardous Substances (RoHS) is available on the [EU website](#)

## Non-legislative Requirements

Although compliance with non-legislative requirements remains voluntary, buyers often request such compliance. Many 'private' or 'voluntary' standards were originally established by industry players themselves. Although producers often perceive such standards as a barrier entering a market, compliance also constitutes an opportunity to enhance the export competitiveness of your products.

**Quality management systems (QMS) – ISO 9001.** If you plan to export to Europe, all products must meet the quality demands of the buyer. The ISO 9001 system was designed to ensure that products manufactured in and/or exported to Europe meet the needs of customers.

For automotive applications, components within assemblies, sub-assemblies and finished goods must meet the quality demands outlined in ISO/TS 16949 QMS.

**Tips:**

- Apply for ISO 9001 as quickly as possible. Understand the requirements of your target customers and, if you plan to target the automotive industry, obtain ISO/TS 16949.
- Consult the document ISO [Quality management systems](#).
- Requirements relating to automotive applications with regard to quality-management systems are also available on the [ISO website](#).

**Functional Safety in accordance with ISO 26262.** The ISO 26262 requirements focus on the functional safety of electrical and electronic systems in vehicles.

**Tip:**

- Apply for ISO 26262. Even though these requirements are not mandatory, they are sure to provide you with an advantage over other exporters from developing countries serving the vehicle industry. Consult the ISO website for additional information on the guidelines [ISO 26262](#).

**Safety of machinery ISO 13849** This legislation provides safety requirements and guidance on the principles for the design and integration of safety-related parts of control systems (SRP/CS).

**Tip:**

- Apply for [ISO 13489](#) as soon as possible if you are planning to sell relays on the European market.

**Occupational health and safety in the electronic-components sector.** Occupational health and safety (OHS) issues include all aspects relating to labour conditions, and they are very often part of the social requirements that EU buyers impose on their suppliers.

**Tip:**

- Consider implementing a management system on OHS (e.g. OHSAS 18000). European buyers are becoming increasingly sensitive and are demanding transparency in the supply chain and with regard to labour conditions at all levels. Even though these requirements are not mandatory, compliance is sure to provide you with an advantage over other exporters from developing countries. Additional information on occupational health and safety in the electronic components sector is available on the [ISO website](#).

**Electronic Industry Citizenship Coalition (EICC) Initiative.** The most important sustainability initiative in the Electronics Sector, in Europe and internationally, focuses on social, ethical, health and safety, and environmental issues. Members are required to comply with the requirements of the Code. Some industry buyers can require their suppliers to follow the EICC code of conduct. This is especially relevant for first-tier suppliers in the automotive industry.

**Tip:**

- Identify which of your potential clients or which industries are likely to require the EICC code of conduct. Try to implement this policy. It could provide you with an advantage over other exporters. Explain the steps that you have taken in this regard on your website and in your company's other literature. Consult the [EICC](#) website for additional information on the sustainability initiative.

## Trade Statistics

### Imports and Exports

Germany offers exporters from developing countries good prospects for entering the electronic components sector (including relays). Electronics and Electrical Engineering is the third-largest industry in Germany, following the automotive and mechanical/plant engineering industry. The development of the electronic components sector in Germany will have a direct impact on relays, which are used in nearly all electrical devices in which safety with regard to electrical current plays an important role. Exporters from developing countries can develop a competitive edge based on better-priced product offerings for relays. The ability to meet current market requirements is crucial, including with regard to the quality and design of products, as well as with regard to short production time and favourable delivery terms.

**Figure 1: Imports of relays to Germany in 2014, in %**

	Share of total EU imports (2014)	CAGR* of total imports (2009-2014)	Imports from developing countries as a share of total imports (2014)
Imports	19.8%	9.1%	12.6%
*Compound annual growth rate			

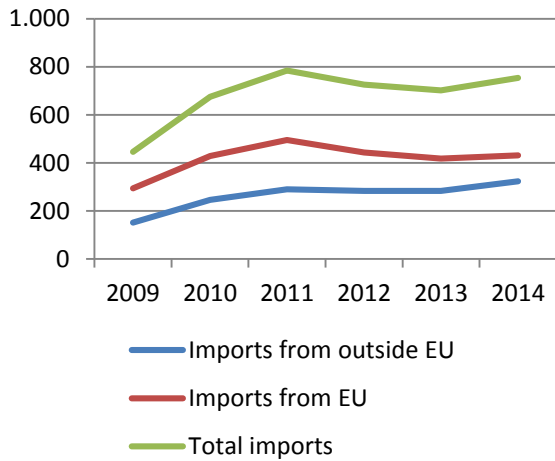
Source: Eurostat (2015)

**Figure 2: Exports of relays from Germany in 2014, in %**

	Share of total EU exports (2014)	CAGR* of total exports (2009-2014)	Exports from developing countries as a share of total exports (2014)
Exports	32,5%	8.2%	11.6%
*Compound annual growth rate			

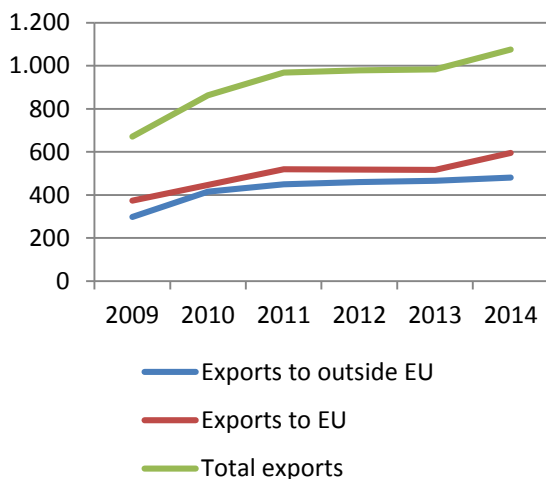
Source: Eurostat (2015)

**Figure 3: Imports of relays to Germany, value in € million**



Source: Eurostat (2015)

**Figure 4: Exports of relays from Germany, value in € million**



Source: Eurostat (2015)

### Most important developments

Demand has stabilised, following a brief period of weakness in 2012. The demand for relays and imports depends primarily upon the automotive, industrial and power applications in Germany. There has been a significant overall decline in the European market. The development of relays in Germany might be more favourable than it is in the European market as a whole.

#### Tip:

- Enter the German market with a value-for-money proposition for relays. Given the growth in the electronics and electrical engineering sector in Germany, start actively looking for partners in the industries with high demand, including automotive, automation and energy.

Imports of relays from outside Europe (e.g. China) to Germany have been increasing again, and trade with China, Malaysia, Thailand, the Philippines and Turkey expanded in the period 2009–2014. The reasons primarily involve the better-priced product offerings, as well as short production times and favourable delivery terms.

**Tip:**

- Exporters from developing countries have proven their ability to build relays of solid quality and to sell them on the European market. Optimise your production process in order to meet all current market requirements, including those relating to the quality and design of products, short production times and favourable delivery terms.

Exports of relays have exhibited a slight upward trend (including trade with the leading export markets, including France, the UK, Hungary, the Netherlands and Belgium).

**Tip:**

- Germany's status as a trade hub opens the possibility of targeting other European countries through re-export. It is nevertheless important to be aware of the stagnating and vulnerable economic development in other European countries.

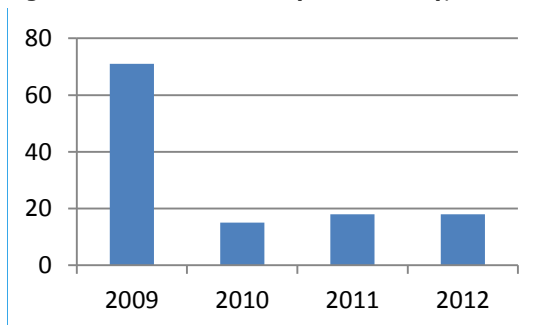
## Production

The growing demand for energy and the increasing penetration of electronic content into major application industries – including the automotive, automation and energy industries (incl. power transmission) – is generating significant growth potential for suppliers of relays in Germany. For example, consider differentiating your product offerings in order to enter the energy-application industries.

**Tip:**

- Germany's status as a trade hub opens the possibility of targeting other European countries through re-export. It is nevertheless important to be aware of the stagnating and vulnerable economic development in other European countries.

**Figure 5: Production of relays in Germany, value in € million**



Source: Eurostat Prodcom (2015)

### Most important developments

The demand for relays is driven by the increasing amount of electronic content in automotive applications, in the development of renewable energy (and the associated development of the power grid) and in response to the growing importance of new markets (e.g. e-vehicles). The Western European market for power-transmission solutions is expected to experience growth in the low two-digit range through 2020, thus increasing the demand for relays.

**Tips:**

- A good first step in entering the market could be to supply low-cost relays. This could help you to build a reputation and trust.
- Be aware of other current market requirements, including those relating to the quality and design of products, short production times and favourable delivery terms.

The national production of relays has decreased significantly. Because production has become too cost-intensive, many German companies have relocated to lower-cost European countries (e.g. Portugal). The remaining German producers of relays are focusing on high-tech relays that generate higher margins.

**Tip:**

- Depending on your production capacity and expertise, consider supplying relays to market segments that are growing (e.g. photovoltaics, power grids), in addition to established markets (e.g. the automotive industry). Differentiate your product offering in order to enter various application industries. Stay abreast of trends involving quality and safety improvements in the market for relays.

For additional information on trade statistics, consult [CBI Trade Statistics for Electronics and Electrical Engineering](#).

## Market Trends

### **Most important developments**

- *Technological development:* Technological developments (e.g. energy from renewable resources and electric vehicles) have resulted in the following trends:
  - Relays are penetrating new markets, including e-vehicles, e-mobility infrastructure and power grids (incl. smart metering).
  - The share of electronics in vehicles is constantly growing.

Germany is the largest market for relays in Europe. Manufacturers of relays regard e-mobility, smart metering and photovoltaics as significant drivers of growth in the future.

**Tip:**

- Consider offering relays to industries in Germany that tend to make high investments, including the automotive industry (electric vehicles), the energy industry (wind, solar and other renewable energy projects) and the electronic lighting industry. Consider sharing your knowledge and participating in pilot projects.

*Product innovation:* Smart relays are increasingly being developed and designed to be safer and to allow better life-cycle management. Current features include the ability to monitor temperature load and cut off the relay at the end of its defined life cycle. Market penetration is expected to be slow, however, due to a lack of demand relating to higher prices, especially in the German market.

**Tip:**

- Continue innovating and investing in new product designs, in addition to launching relays that meet the market trends. Expand your product range by introducing smart relays, without neglecting 'classic' relays.

*Product and service quality:* As the demand for high-voltage energy applications increases (e.g. power grid), contemporary relays will need to handle high voltages. This means that requirements for product quality and safety are likely to become stricter. Lead time will become shorter, and the reliability of suppliers will play a significant role in cooperation.

**Tip:**

- Meet the safety and quality demands by incorporating a quality-assurance programme into your production process. Work to optimise the production process and reduce delivery time. Increase the efficiency and flexibility of the production process by introducing a modular production approach and using different technologies. Minimise the risk of damage during production, and meet customer requirements in terms of product quality and delivery time.

*Political measures:* National policies have stimulated the growth of new markets, including photovoltaic and electric vehicles.

**Tip:**

- Stay abreast of national and European legislation in existing and growth markets, in order to anticipate changes and adapt your production and R&D processes at the right time.

*Product design:* In addition to the essential importance of product quality, product design is becoming increasingly important to OEMs in Europe. Developing countries should work to adopt European best practices in the implementation of



quality standards, as well as in product presentation and design (e.g. no signs of handwork on the product surface, clean and accurate packaging).

**Tip:**

- StWork to improve the design and packaging of your products. Work according to European standards, and follow all of the buyer's requirements.

*Cost pressure* is high, and customers are strict in weighing costs and benefits. Innovation is currently suffering under cost pressure.

**Tip:**

- It is advisable to focus on offering standard relays of high quality at competitive prices.

*Minimisation of the total cost of ownership:* With the growing role of international cooperation, European companies will increasingly be facing various risks that must be measured and managed in order to keep the total cost of ownership (TCO; a financial estimate intended to help buyers or owners to determine the direct and indirect costs of a product) at a reasonable (i.e. low) level. Both smaller and larger companies will increasingly be looking for the most reliable suppliers, and they will try to eliminate risks through supplier contracts and cost management.

**Tip:**

- European SMEs are currently presenting better opportunities as potential customers for exporters from developing countries, as they are more open to new suppliers and easier to approach, due to the less complex character of their organisations. Develop your sales and marketing strategy:
  - Develop well-structured and up-to-date content on your company's website;
  - Attend trade shows several years in a row, in order to ensure visibility on the market. Start preparations for the trade show far in advance;
  - Work on your *unique selling proposition* (i.e. why European OEMs should buy your product);
  - Work on the product pricing.

*Fluctuating market:* The relay business is fluctuating. Although the demand from car manufacturers is relatively easy to predict, other industries (e.g. solar applications) are unpredictable, as they depend strongly upon legislative measures (e.g. subsidies), which have been impossible to anticipate in recent years.

**Tip:**

- Exporters from developing countries should ensure a reliable supply chain and find partners that can provide logistical and storage capacity in Europe.

For additional information on market trends, consult [CBI Trends for Electronics and Electrical Engineering](#).

## Market Channels and Segments

The [CBI Market Channels and Segments for Electronics and Electrical Engineering](#) provides a general overview.

## Market Competitiveness

The document [CBI Competition for Electronics and Electrical Engineering](#) provides a general overview.

## What are the end-market prices for relays?

### [Price range for relays](#)

Relays have a wide price range. Approximate price ranges are indicated in the table below. For example, in Europe, the price for relays for voltages >60V but ≤1,000V ranges from €0.35 to €250, depending upon specifications. Suppliers in

several European countries have harmonised their prices; any differences in pricing are due to differences in logistics, taxes and other local costs.

Most important groups of relays for industrial, automotive, lighting, communication and consumer applications	OEM volume price range, in €
Relays for voltages $\leq 60V$ , for currents $\leq 2A$	0.35 – 50
Relays for voltages $\leq 60 V$ , for currents $> 2A$	0.60 – 75
Relays for voltages $> 60V$ but $\leq 1,000V$	1 – 250

Producers in developing countries should be aware of differences in costs and value-chain margins that could add to the product price. The production and administration costs of the manufacturer usually account for 44%–51% of the end price (OEM volume price). The production and administration costs should include all costs for raw materials, development and labour, as well as other fixed and administration costs. To develop a unique selling proposition, exporters from developing countries should understand their own costs, liabilities and responsibilities, and they would do well to analyse product market price levels.

OEM volume price breakdown	Margin
Production and administration costs	50%
Marketing and sales costs in developing countries	3%
Freight to Europe and other related costs	6%
Import and other (e.g. VAT, financing) costs	5%
Marketing costs in Europe	7%
Importer margin	10%
Distributor margin	15%

## Useful resources

### Leading trade fairs in Europe and Germany

- [Electronica](#), world's leading fair for electronic components, systems and applications
- [Hannover Messe](#), world's leading fair for industrial applications and automation
- [PCIM](#), Europe's largest fair for control electronics, intelligent power trains and energy management
- [SPS IPC DRIVES](#), Europe's leading fair for electrical automation
- [Light & Building](#), world's largest fair for light and building applications
- [EFA](#), trade fair for building and electrical technology, lighting, climatisation and automation
- [Eltec](#), fair for electrical and energy technology

## Important resources

- [Eurostat](#)
- [Eurostat Prodcom](#)
- [ZVEI](#)
- [VDE](#)
- [FBDI](#)
- [Energie und Technik](#)
- [Mouser Electronics](#)

## **Additional information**

CBI market information:

- Trade Statistics for Electronics and Electrical Engineering;
- Trends for Electronics and Electrical Engineering;
- Market Channels and Segments for Electronics and Electrical Engineering;
- Competition for Electronics and Electrical Engineering;
- 10 Tips for Doing Business in the Electronics and Electrical Engineering sector
- Finding Buyers in the Electronics and Electrical Engineering sector



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April 2016