

## Media information

### The solution for Europe: type 2 charging sockets with or without shutter

One factor of success to enforce electric mobility is a simple and uniform charging of electric vehicles across Europe. This requires a Europe-wide definition of a consistent system for the charging connection. But up to now the European nations could not come to an agreement about an uniform standard for electric vehicle charging connectors.

A fundamental point of discussion was the demand issued by a few countries to provide additional physical protection against contact in the form of a so-called 'shutter'.

### Three systems worldwide

Around the world, three different charging systems are standardised for the connection of electric vehicles. These are defined in standard IEC 62196-2 and are not compatible with each other. Generally, all three standard systems meet the high safety requirements for the consumer. The voltage is only added when the system has recognised that the plugs are completely inserted at the vehicle and infrastructure side, that the plugs are locked and that the connection of the protective earth conductor is correct. If one of these conditions is not met, charging will not start. This comprehensive safety system makes additional mechanical protective devices for the contacts – such as protection against contact beyond finger safety – unnecessary.

Type 1 from Japan is only designed for single-phase operation and offers limited options for three-phase European main grids.

Therefore, type 1 will be used only for a short time in Europe.

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The European market can only use types 2 and 3. They are completely different in their design. Type 2 has a single plug geometry for all charging capacities from single to three-phase. Type 3 is available in three different geometries, depending on charging capacity and number of phases.

Type 2 has no additional protection mechanism, while type 3 has a shutter system. Type 2 is also used as basic system for the Combined Charging System (AC + DC), which is actually under preparation in the IEC standard.

### **Objectively considered type 2 is the best solution**

The German Federal Association of the Electric and Water Industries (BdEW), the German Automobile Industry Association (VDA), the German Association for Electrical, Electronic and Information Technologies (VDI), and the German Central Association of the Electrical Engineering and Electronics Industry (ZVEI) compared types 2 and 3.

The clear result: Type 2 is the best solution for Europe! The system looks at both - the infrastructure and the vehicle side in its entirety.

Type 2 plugs and sockets can be used in the icy north as well as in the sunny south!

The robust plugs and connectors do not require any moving parts that may be blocked by ice or dust. The risk of damage is minimised, and even driving over the plug poses no risk. Redundant safeguarding on several levels warrants highest safety.

All contacts of a type 2 plug or connector are voltage-free when not plugged in.

Voltage is only released when several conditions are met simultaneously.

Type 2 can handle all relevant power types used throughout the world, from the single-phase alternating current (AC) used in private households to the powerful three-phase connections with 63A.

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### Europe prefers type 2

Most European countries have already chosen type 2 in light of its impressive advantages, and this is why it is already known as the 'Europe plug'. A number of other countries have already endorsed type 2, even though they still have not yet developed any kind of infrastructure for electric mobility. According to the Eurelectric position paper released in March 2012, they consider type 2 the "de facto standard" for Europe.

Other countries which have not yet started any activities towards electric mobility are still waiting for the vote of the European Committee before making a decision.

### Some countries want a shutter solution

Charging couplers do not require shutter mechanisms due to the communication and safety features used.

In some European countries the national standards for household plugs and sockets require IP XXD shutter. And this requirement is often transferred to charging systems. This variation makes it more difficult to be able to offer a unified charging system for the whole of Europe. France, for example, is demanding IP XXD-compliance contact protection for charging sockets used in private areas and therefore prefers type 3.

In public areas, IP XXB-compliant charging sockets already satisfy the requirements imposed by the law and standards.

However, national requirements must not be allowed to be made a European problem. It would be unreasonable to expect consumers to have to use different charging cables or adapters to charge their electric vehicles.

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### **The solution for Europe: type 2 charging sockets with and without shutters**

In response to the practice in these countries, MENNEKES has developed an add-on for type 2. This has resulted in a modular system that permits equipment type 2 sockets with a shutter. In countries that do not impose this requirement, the shutter can simply be omitted. This makes the type 2 socket a solution for the whole of Europe that satisfies the demands for both increased robustness and improved protection against physical contact. The Mennekes solution provides options in the contact protection either the standard IP XXB contact protection or the enhanced IP XXD contact protection.

This enables the best solution to be used throughout Europe, even in places where country-specific installation practices require a shutter solution. Type 2 charging sockets with and without shutters are compatible without restrictions and can be used with the same charging cables. With this system, MENNEKES is offering a type 2-based solution that satisfies the wishes of all of the market players throughout Europe, thus clearing away the last obstacles to a unified charging system for the whole of Europe.

### **Socket type 2 without shutter for most European countries**

The type 2 socket meets IP XXB contact protection requirements and therefore also fully satisfies the requirements of IEC 62196-2. It can be individually installed in charging stations. Protection class IP 54 is provided thanks to the hinged lids, thus protecting against the penetration of splash water and against dust. An integrated water drainage ensures that no damaging water condensation can collect. MENNEKES' type 2 sockets have an interlocking actuator that locks the plug in place during the charging process. In connection with the MENNEKES actuator control wire part no. 30537, the MENNEKES type 2 sockets feature an integrated unlocking function in case of a power failure.

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The four-point fixture system provides a secure hold in the charging station and also allows for a concealed fixture system. This means that the socket is protected from manipulation from the outside. All contacts are fitted with screw terminals. The terminal construction design is the fruit of MENNEKES' expertise as a leading manufacturer of industrial sockets.

### **Socket type 2 with shutter allows for country-specific features**

Type 2 sockets with shutters are designed to address requirements in countries where household sockets must be fitted with shutters. The shutter provides IP XXD-compliant contact protection. It also satisfies the requirements of protection class IP 44 (protection against splash water). As the same basis is used for the shutter socket as well as for the standard model, it offers all of the advantages of the standard version.

It is quite easy to handle and can be operated with just one hand. The ring in the socket is turned around 60 degrees to the left using the plug. This opens the shutter and the plug can be plugged in completely. When charging is completed, the plug can simply be pulled out. The shutter closes on its own at once and the contacts are touch-protected again.

### **Conclusion**

The shutter solution for type 2 charging sockets from MENNEKES is the key to a Europe-wide unified standard for charging sockets. In the most countries the usual type 2 socket can be used. Wherever country-specific installation practice prefer the use of an enhanced contact protection mechanism in private areas, the type 2 charging socket with shutter can be used.

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Whichever way it is looked at, type 2 is technically impressive. This has been shown by the recommendations of the European Automobile Manufacturers' Association ACEA and those of the German Federal Association of the Electric and Water Industries (BdEW), the German Automobile Industry Association (VDA), the German Association for Electrical, Electronic and Information Technologies (VDI), and the German Central Association of the Electrical Engineering and Electronics Industry (ZVEI) in their position papers. The type 2 shutter solution is designed to appease the current concerns of a small number of national representatives, thereby making an unanimous vote in favour of type 2 as the standard European charging plug possible.

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Picture:

Picture 1: Eye-opener: A map of Europe with type 2 with and without shutters



The solution for Europe: Type 2 charging sockets with and without shutters. The shutter solution for type 2 charging sockets from MENNEKES is the key to a Europe-wide unified standard for charging sockets.

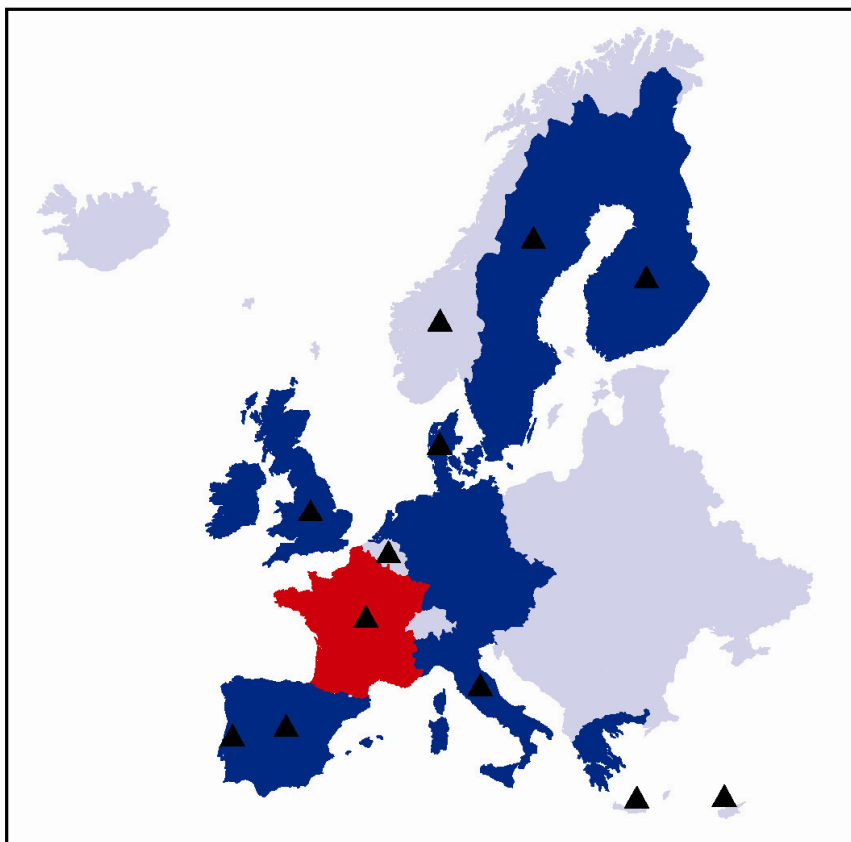
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Image 2: Map of Europe: current situation with legend



- Decisions for type 2 ■ Decisions for type 3
- No decisions yet
- ▲ Countries with shutter requirements for household sockets

Current situation according to Eurelectric Position Paper March 2012

Most European countries have already chosen type 2 in light of its impressive advantages, and this is why it is already known as the 'Europe plug'.

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Image 3: One-hand operation



The type 2 charging socket with shutter can be used with just one hand. Simply fit the plug, turn it, and insert it. The mechanism closes of its own accord when pulling the plug.

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*MENNEKES Elektrotechnik GmbH & Co. KG was founded in 1935 and is the developer of the German standards draft for charging couplers as well as leading manufacturer of industrial plugs and sockets. The company has a global presence with subsidiaries and representations in more than 90 countries and employs more than 900 people worldwide. The product range comprises standardised plugs and sockets in over 11,000 different variants and designs as well as charging couplers for electric vehicles, which were awarded with the first VDE test seal ever. We take an integrated approach towards electric mobility and develop components like charging plugs, charging cables and vehicle inlets as well as complete charging stations for commercial and private application. The solutions thus fulfil perfectly the requirements of car manufacturers, electric utilities and consumers. In the past business year, the MENNEKES Group achieved a consolidated turnover of more than 110 million Euros. More than half of the turnover is made in export.*

*More information at [www.MENNEKES.de](http://www.MENNEKES.de) and at Facebook, Twitter and YouTube.*

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