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JEH

Treatment of industrial plug-in connectors in accordance with the Low-voltage Directive, 2006/95/EC

Experience has shown that some uncertainty exists within the European Single Market concerning the CE marking of industrial connectors in accordance with the Low-voltage Directive, 2006/95/EC [1]. Therefore connectors of the same type from different manufacturers can be found with and without CE-marking

The CE-marking on a product symbolizes, that the product is covered by a harmonizing EU directive, that the legal requirements are fulfilled and therefore national authorities shall not impede its free movement within the European Economic Area. The CE marking is no safety or quality mark.

Industrial connectors exist in a wide spectrum of different variants, types and applications. The precise delimitation of particular product groups is essential, especially under consideration of decisions in the LVD-ADCO concerning CEE plugs. [3]

The majority of connectors is not within the scope of the LV Directive, explicitly connectors loaded with low voltage and distributed as separate parts. In such cases CE marking is prohibited. But, CE marking is mandatory if the products are within the scope. This situation might confuse manufacturers and users. For this reason clarification of the topic and the harmonized application of LV Directives is necessarily required throughout the entire EU.

Legal background

The Low-voltage Directive [1] by definition covers "electrical equipment" for voltages between 50 V and 1000 V AC or 75 V and 1500 V DC. In Articles 8 and 10 and in Annex III, it requires manufacturers to issue a declaration of conformity in respect of such equipment, and to affix the CE marking to it. "Basic components" are however not regarded as equipment in the context of this directive, and therefore are outside of its scope.

Basic components excluded from the scope in this way are defined in the European Commission's Guidelines on the Low-voltage Directive [2]. According to Section 9 of these guidelines, these are components *"the safety of which can only, to a very large extent, be assessed taking into account how they are incorporated"*. The corresponding Footnote 13 of the guidelines explicitly lists "connectors" as an example.

Technical background

No universal and legally binding definition exists for industrial connectors. The term is applied to very diverse product types which differ in purpose and the way in which they are placed on the market. Accordingly, their status with regard to the Low-voltage Directive may be assessed differently from one case to another. The following main groups are identified:

1. *Intended operational voltage outside the voltage limits of the Low-voltage Directive:* Many industrial plug-in connectors for electronic and data transmission purposes operate on voltages below 50 V AC or 75 DC. By definition, the Low-voltage Directive does not apply to such products. This is equally valid in case of medium-voltage and high-voltage connectors for voltages above 1000 V AC and 1500 V DC.

⇒ **No CE marking in accordance with the Low-voltage Directive**

2. *Safety is mainly assessable only after installation:* For connectors intended for internal installation in equipment and devices, for instance the essential safety aspect of protection against access to hazardous parts is missing usually. This protection is achieved only after final assembly. The components are therefore basic components according to the guidelines, and do not fall within the scope of the Low-voltage Directive.

⇒ **No CE marking in accordance with the Low-voltage Directive**

3. *Connectors available as discrete parts of a modular system only:* Heavy industrial connectors with enclosure are predominantly distributed by connector manufacturers as separate items. The user (manufacturer of equipment or machinery) selects among various types of enclosures, cable entries, bodies and contact elements from a catalogue according to the requirements of his application, and makes final assembly himself. In this case, safety is assured essentially by the proper selection and assembly of the individual parts, which is the responsibility of the user. The connector manufacturer is to be seen as subsupplier who is distributing only "parts for a connector", and has himself in practise no influence upon the safety of the complete connector in the application. The distributed parts are therefore basic components in the context of the guideline to the Low-voltage Directive.

⇒ **No CE marking in accordance with the Low-voltage Directive**

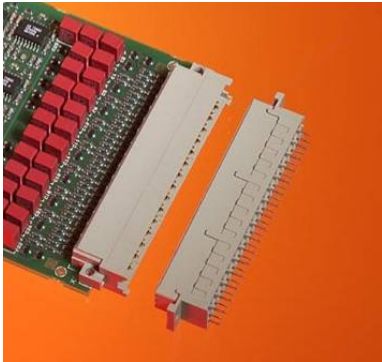

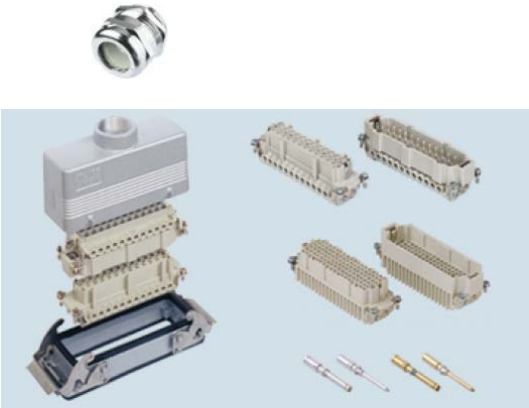
4. *Complete connectors and plug-and-socket devices:* Provided the intended operational voltage is within the voltage limits specified in the Low-voltage Directive and the connector is distributed as complete set, with enclosure for protection against access to hazardous parts, with cable entry, contact elements etc., such that the user needs just to connect a cable, the product is regarded as equipment in the sense of the Low-voltage Directive. CEE circular plug-and-socket devices according to EN 60309 are listed explicitly by the LVD-ADCO as being subject to compulsory CE marking [3].



⇒ **Compulsory CE marking in accordance with the Low-voltage Directive**

Selected examples for the various cases are provided in the annex below for the purpose of illustration.

Annex

**Examples of industrial plug-in connectors
and their classification with regard to the Low-voltage Directive, 2006/95/EC**

	Type	CE to 2006/95/EC ?	Justification
1	 <p>Printed board connector</p>	No	Basic component for internal installation inside equipment
2	 <p>Internal and external connectors for data and communication applications</p>	No	Operation at extra-low voltage below 50 V AC or 75 V DC. In addition, in the case of internal application: basic component.
3	 <p>Heavy industrial connectors, distributed as separate parts</p>	No	Safety can be assessed only after selection of the separate parts and assembly by the user for his specific application. Separate connector parts are basic components.

	Type	CE to 2006/95/EC ?	Justification
4	 <p>Heavy industrial connector distributed as complete set (with or without cable)</p>	Yes	Operation within the voltage limits of the Low-voltage Directive, safety largely assessable on the product itself.
5	 <p>CEE plug-and-socket devices (EN 60309)</p>	Yes	Operation within the voltage limits of the Low-voltage Directive, safety largely assessable on the product itself.

References

- [1] "Directive 2006/95/EC of the European Parliament and of the Council of 12 December 2006 on the harmonisation of the laws of Member States relating to electrical equipment designed for use within certain voltage limits" (the "Low-voltage Directive", identical to the former directive 73/23/EC in conjunction with 93/68/EEC)
- [2] European Commission (eds.): "Guidelines on the Application of Directive 2006/95/EC (electrical equipment designed for use within certain voltage limits)". August 2007.
- [3] LVD-ADCO: "List with examples of products within or outside the scope of LVD" (07-LVD 06/1/5 borderline products). Adopted at LVD Working Party of the European Commission, Brussels, 15 November 2006.