



EUROPEAN POWER SUPPLY MANUFACTURERS ASSOCIATION
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CE MARKING GUIDANCE FOR POWER SUPPLIES

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1 Introduction

The most relevant European Directives to power supplies are:

- 73/23/EEC, the Low Voltage Directive (LVD)
- 92/59/EEC, the General Product Safety Directive
- 89/336/EEC, the Electromagnetic Compatibility Directive, amended by Directive 92/31/EEC
- 93/42/EEC, Medical Devices Directives

There are other directives referring to other applications.

According to 93/68/EEC (CE marking) for every CE-marked product the supplier shall have a Declaration of Conformity and prepare documentation to prove compliance with applicable standards and directives.

This document was prepared by the Technical Committee (TC) of EPSMA to find a common understanding and interpretation of CE-marking among EPSMA companies and their customers.

2 Summary

- On 1 January 1997 it became mandatory to CE mark under the LVD.
- The EMC Directive does not apply to those Component Power Supplies which are intended for a professional assembler or installer.
- For Power Supplies intended for free-standing operation, or component power supplies considered as equivalent to apparatus, the EMC Directive is mandatory and CE marking is required.

3 Definitions

3.1 Component Power Supplies (CPS), intended for a professional assembler / installer

Also known as OEM, Modular or Sub Unit Power Supplies. These are designed, produced and intended to be "professionally installed" into a final product. "Professionally installed" requires that the installer is technically competent and able to satisfy the requirements of the Directives applicable to the final product. CPS are not intended for free standing applications and are not intended to be accessible to the final user. Typical examples of such power supplies include open card, open frame, plug-in card power supplies, enclosed and encapsulated units or power supply modules.

3.2 Component Power Supplies (CPS), considered as equivalent to apparatus

These PSUs (Power Supply Units) are considered to be apparatus with respect to their EMC requirements, for example those PSUs intended for use in installations or sold to the general public, cases where no further EMC tests are anticipated. This does not include PSUs sold as spares for repair which have been tested as part of an overall equipment. Typical examples of such power supplies are PSUs with integral mains and/or IT equipment connectors that are sold to the general public for upgrading PCs, for use with printers, etc. and PSUs intended to be used (with the addition of appropriate casing, wiring, etc.) in installations where the EMC performance will not be measured by the installer.

3.3 Power Supplies intended for free-standing operation (individual apparatus)

These are intended for free standing operation in laboratories, workshops and other areas. As such they are accessible to the final user. Typical examples include bench units, laboratory power supplies, free standing and wall mounted products, plug-top types, and battery chargers.

4 Component Power Supplies (CPS)

CPS are intended to be incorporated in other equipment and are not complete in themselves, i.e. they are components or sub-assemblies. As components they cannot fully comply with the provisions of any Directive without "Conditions of Acceptability". It is the responsibility of the installer to ensure that the final product housing these components complies with the requirements of all applicable Directives for the product. The installer then has the task to affix the CE marking to the final product conferring presumption of conformity.

4.1 Low Voltage Directive (LVD)

- The LVD was adopted by the European Council on 19th February 1973. It applies to electrical apparatus with a specified AC supply voltage of 50V to 1,000V or DC supply voltage from 75V to 1,500V. (Note: For CPS used in equipment subject to the RTTE Directive (see 4.3.2.), the LVD is applied with input voltage limits which start at 0V).
- CPS with a specified supply voltage range within these limits are subject to the provisions of the LVD and shall be CE marked under the LVD.
- Since 1997-01-01 CE marking under the LVD became mandatory.
- CPS with specified supply voltage range outside these limits are not subject to the provisions of the LVD. However they must be safe, and further should comply with the General Product Safety Directive 92/59/EEC (GPSD) where they might be used in consumer products or in products which might be used by consumers. They are not CE marked under the LVD (or the GPSD).

4.1.1 CPS for general use should comply with EN60950, with the provision that the installer is responsible for protection against danger due to electrical shock, temperatures, radiation or fire. EN61204-1 has been published in Nov. 2001 and may also be used, however its application must be checked.

4.1.2 Equipment for measurement, control and /or laboratory use: CPS intended for this equipment should comply with EN61010-1.

4.1.3 CPS intended for use in medical equipment covered by the Medical Devices Directive should comply with EN60601-1.

4.1.4 CPS intended for use in audio or video systems should comply with EN60065

4.1.5 CPS intended for industrial use may also comply with EN50178.

4.1.6 CPS intended for residential applications shall comply with EN 60335-1 and/or EN 60335-29

Important note: Although many safety standards are acceptable under the LVD they do not all have the same flammability requirements as EN60950. Manufacturers are strongly advised to comply with the flammability requirements of EN60950.

4.2 EMC Directive

For the purpose of the EMC Directive a "component" is defined as any item which is used in the composition of an apparatus and which is not itself an apparatus with a direct function intended for the final user. Therefore CPS intended for a professional assembler / installer are outside the scope of the EMC Directive. It is the responsibility of the final equipment manufacturer to ensure that the end product complies with the EMC Directive and to CE mark for it. In this case it is possible that a CPS does not fulfil EMC requirements on its own because some EMC parts, e.g. power line filters, are installed at the main power input line of the apparatus (refer to the Declaration of Conformity). A CPS is a possible source of electromagnetic interference, but the configuration of the equipment into which it is installed can significantly alter the EMC characteristics as measured on the CPS in isolation. Also, the installer may experience difficulties in ensuring that the final equipment complies with the EMC Directive if the design of the CPS has not taken into account EMC considerations.

4.2.1 CPS for general use should satisfy the generic standards. Full compliance with the requirements of these standards, however, applies only to the final equipment, not to the CPS inside the equipment.

- for the residential, commercial and light industrial environment:
 - emission: EN 50081-1
 - immunity: EN 50082-1
- for the industrial environment:
 - emission: EN 50081-2
 - immunity: EN 50082-2 (DOW:2002-04-01, replaced by EN 61000-6-2 from 2001-04-01)

4.2.2 CPS intended to be used within telecommunications network should be designed with the EN 300 386-2 product standard in mind. Full compliance with the requirements of these standard, however, applies only to the final equipment, not to the CPS inside the equipment. CPS intended for a particular application should always be designed with the product EMC standards for that application in mind.

4.2.3 CPS which are intended to be used in installations or sold directly to the public, where it is anticipated that no further EMC tests will be done, must fulfil the EMC requirements like stand-alone power supplies and must be CE marked for the EMC Directive.

Since the method of installation, the wiring and the earthing arrangement influence the EMC behaviour of a CPS, it is important to document the test conditions very accurately.

4.3 Other Directives

4.3.1 Machinery Directive (89/392/EEC)

A CPS is not a machine in the meaning of the Machinery Directive and shall not be CE marked for this Directive. To comply with the requirements necessary to be installed into a "machine", a CPS should comply with EN 60950, and the following standards as applicable to the CPS and the application : EN 60204 and EN 60292. Interlocking is the responsibility of the machine manufacturer. A CPS does not require a Certificate of Incorporation.

4.3.2 Radio equipment and Telecommunications Terminal Equipment Directive (RTTED 99/5/EC)

A CPS is not intended to be connected to the telecommunications network and is thus not a RTT Equipment. It shall not be CE marked for this Directive. To satisfy the requirements for use RTT Equipment a CPS shall comply with EN60950, with clause 6 being addressed. For reference, it is interesting to note that this Directive calls up the LVD and the EMC Directive, and additionally it removes the lower voltage limits of the LVD i.e. 50Vac and 75Vdc

4.3.3 Medical Devices Directive (93/42/EEC)

A CPS is not a medical device and shall not be CE marked for this Directive. To satisfy the requirements for use in medical devices the design of a CPS must be based on EN60601-1-1 for safety and EN60601-1-2 for EMC. Note: The EMC standard EN60601-1-2 states no requirements for the harmonic content of the input current at this time. Since 2001-11-01 a new version of the EN 60601-1-2 is adopted. In this new version EN 61000-3-2 / -3-3 has to be fulfilled. The transition period (DOW) will end on 2004-11-01.

4.3.4 General Product Safety Directive (92/59/EEC)

This Directive, although not requiring CE marking, requires that all products placed on the market shall be safe. It mainly applies to Consumer Products, however, its requirements are in effect generally applied via Health and Safety Legislation. It further requires that products shall be supplied with adequate instructions and labelling to ensure safe use and, unlike the LVD, has no input voltage limits. This Directive is in the process of being revised to clarify its somewhat nebulous wording. Amongst other things, it will be changed to mandate the use of harmonised standards to show compliance, prohibit the export of unsafe products outside the EU, modify and strengthen the product recall procedures, and place a heavier legal burden on the manufacturer.

To fulfil this Directive or Health and Safety Legislation, power supplies outside the scope of the LVD should still comply with a recognised harmonised standard e.g. EN60950, and proof should be available in the form of test reports. Even if a power supply does not present shock hazards, it still may present a fire or energy hazard.

4.4 Prototypes

Prototypes shall not be CE marked but must be safe.

It is the responsibility of the installer to ensure that final equipment containing a prototype CPS is not placed on the market nor made available to the end-user.

5 Stand Alone Power Supplies and CPS Considered as Equivalent to Apparatus

5.1 Low Voltage Directive (LVD)

Stand Alone Power Supplies and CPS considered as equivalent to apparatus shall be CE marked under the LVD if the voltage range applies. Documentation to prove compliance and a Declaration of Conformity are mandatory.

5.2 EMC Directive

Stand Alone Power Supplies and CPS considered as equivalent to apparatus shall be CE marked under the EMC Directive. In the absence of dedicated product standards, the generic standards e.g. EN50081-1 and EN50082-1 (Residential, commercial and light industry) must be used. Documentation to prove compliance and a Declaration of Conformity are mandatory.

5.2.1 Harmonics

Since 2001-01-01, the standard EN61000-3-2 is in force in Europe and shall be applied. As part of the EMC Directive, this standard will apply to Stand Alone Power Supplies and CPS considered as equivalent to apparatus provided they fall within its scope. Essentially the scope covers all equipment connected to the 230Vac public mains supply.

A new edition of the standard (EN 61000-3-2:2000) has been released including A14:2000 and prA3:2001.

Note: refer to EPSMA document "Harmonic Current Emissions and Power Factor Correction (PFC)"

5.2.2 Flicker

A new standard EN 61000-3-3 brings in a voltage deviation requirement which relates to inrush current on power supplies. The maximum voltage deviation above relates to a mains source impedance of $(0.4 + j0.25)$ ohms, and with regard to power supplies, relates in turn to inrush current. Refer to the standard for details.

6 Technical File / Documentation

The Technical File/Documentation shall be held by the manufacturer or his European representative and must be stored within the EU for ten years following the sale of the last unit.

This documentation shall be made available at the request of an Enforcement Authority.

The Technical File/Documentation shall comprise:

- a general description of the unit including installation and maintenance instructions
- sufficient drawings, diagrams, circuit diagrams and descriptions of operation to demonstrate the means of meeting the requirements of the Directives.
- a list of standards applied

- the test reports
- the EC Declaration of Conformity, stating compliance with applicable standards and directives.

7 Handbooks/Installation Instructions

The directives applicable to the CE marked product and a statement of the intended use of the product shall be include in the handbook. For CPS intended for a professional assembler / installer the handbook shall include a statement of the intended use of the product and the note: "This product is designed only for inclusion by professional installers within other equipment; it must not be operated as a stand alone product".

8 New Standards for Power Supplies

IEC/EN 61204-3 has been released as a product standard covering the EMC requirements of power supplies. The standard is applicable to Stand Alone Power Supplies and CPS considered equivalent to apparatus, and can be used as a guide for component power supplies for professional installation.

IEC 61204-7, Safety Standard for Power Supplies, is currently in preparation and will eventually become an EN for use in proving compliance to the LVD. It is based on IEC/EN60950, IEC/EN61010-1, IEC/EN60601-1, IEC/EN60065 and UL1801 (Centralised DC Power Distribution System for Telecoms).

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