

Technical article

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Authors

Sebastian Fischer, Andreas Flühler

Replacing the EN 60950-1 with the EN 62368-1: Now things get serious

For many years now, a new, common standard for safety requirements for audio/video, information and communication technology has been in the works in the standards committees – the IEC/EN/UL 62368-1. The first version of the IEC 62368-1 was published in 2010. The current EN 62368-1 in its 2nd edition has been in effect since 2016. This article will illustrate why things will get serious in 2020, what the replacement of the “previous standard” EN 60950-1 means for electrical equipment, and what system developers need to know regarding the selection and further use of power supplies.



Introduction

If a manufacturer or importer of electrical equipment intends to put those into circulation in the European Union market (EU, EFTA and other countries), a CE label is required if the equipment is subject to an EU directive (such as the low-voltage directive). By means of this CE declaration, the manufacturer confirms the electrical equipment's safety and/or conformity. In this context, the term 'electrical equipment' comprises a variety of devices such as industrial PCs, measuring devices and other instruments referred to as “terminal devices” below, as well as components such as AC/DC switching power supplies, which in turn may be part of a terminal device.

As a rule, a harmonized standard is used for evaluating the safety. The terminal device's compliance with the standard's safety regulations is then checked by an accredited certification body (e.g., TÜV, SIQ, UL, etc.) and confirmed by means of a report with a certificate. For many years, a widespread standard in this regard has been the EN 60950-1. This standard basically describes information technology equipment, but it is also used for evaluating the electrical safety in many other areas. As a result, developers of terminal

devices often rely on components, e.g., power supplies, that were also tested in accordance with the EN 60950-1 and for which there is proof of a safety check by means of a report and certificate.

The pending replacement of the EN 60950-1, which will no longer be valid in Europe as of 20 December 2020 (or, more precisely: whose presumption of conformity for the EU low-voltage directive will be withdrawn) results in several relevant issues for system developers and those responsible for terminal devices that will be illustrated in the following at the example of power supplies (AC/DC switching power supplies and DC/DC converters).

EN 60950-1: Which standard will replace it, and what are the differences?

The EN 60950-1 will be replaced by the EN 62368-1. After several delayed deadlines, this will now take place on 12/20/2020. On this date, the EN 60950-1 will be withdrawn from circulation and declared invalid. The focus of both standards lies on the basic (among others, electrical) safety requirements for (terminal) devices in different product groups intended for the user's protection.

To this end, the “new” standard EN 62368-1 follows a risk-based approach to assess whether or not a product is safe. Various risk sources, protective measures and user groups are defined to achieve this. Depending on the energy source's risk potential (e.g., electrical voltage) and the user's category (e.g., normal user), a corresponding protective device must be provided. In an AC/DC switching power supply, a reinforced insulation between 230VAC input side and DC direct current side could serve as an example of such a protective measure (unless the user circle should be restricted to specially trained persons).

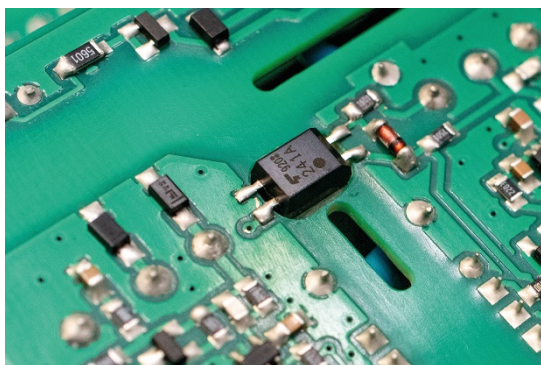


Fig. 1: Example of a protective device: Insulation / separation by means of increased clearance and creepage distances.

In addition, depending on type and predominant area of use, other standards may also apply for power supplies. We should mention the EN 61010-1 standard in this context, which, in particular, will become the relevant standard for the power supply to control devices in industrial settings ("control cabinet"). However, for reasons of simplicity, this article will exclusively deal with the EN 62368-1 in the following. Ultimately, the differences between the two standards (the "old" EN 60950-1 and the "new" EN 62368-1) for the actual technical establishment of power supplies tend to be rather small and often do not require any design changes (at least not for Traco Power).

Which electrical terminal devices require certification in accordance with the EN 62368-1?

All products subject to the EU low-voltage directive must be provided with a CE label for circulation in Europe. As described above, this requires that the device's safety has been guaranteed, which in turn is accomplished by means of safety standards. If a manufacturer or importer previously certified his terminal device in accordance with the EN 60950-1, there is a high probability that he must now comply with the new standard EN 62368-1 to be allowed to put his device into circulation in Europe after 12/20/20. Of course, it is also possible to apply another harmonized standard that is listed under the low-voltage standard (e.g., the EN 61010-1).

Which power supplies require an EN 62368-1 certification?

What does this mean for a system developer who is using or planning to use components such as DC/DC converters and/or AC/DC switching power supplies for the power supply of his EN 62368-1 compliant terminal device? Will this always require a power supply that is also certified in accordance with EN 62368-1?

First, it must be mentioned in this context that, as a matter of principle, only power supplies that are subject to the EU low-voltage directive must be provided with a CE label. If such a power supply is certified according to the EN 62368-1, the safety in compliance with the directive is assumed, and the power supply may be provided with a CE label and put into circulation. If such a power supply is "only" certified according to EN 60950-1, this presumption of safety will become void as of 12/20/20. As of that date, the power supply may only be put into circulation if it has been certified according to EN 62368-1 (or another valid standard).



Fig. 2: 450 Watt power supply unit with CE certification for IT applications (EN 62368-1) and medical technology (EN 60601-1)

For power supplies not subject to the directive, no CE label may be issued. The limit below which power supplies are not subject to the low-voltage directive is defined at 50VAC or 74VDC. This indicates that AC/DC power supply units generally are subject to this directive and therefore must also have the EN 62368-1 certification as of 12/20/20 to continue to be legal for sale in Europe.

What does this mean for the user of power supplies?

Many industrial DC/DC converters have a nominal voltage ≤ 75 VDC and are therefore not subject to the directive, which means they may be put into circulation and used by the terminal device manufacturer without EN 62368-1 certification. Exceptions are possible, if the DC/DC converter is used in an environment with increased requirements regarding the converter's insulation to ensure the user's safety (safe separation by means of reinforced or doubled insulation). Due to the normally higher input voltages (typically up to 160 VDC), DC/DC converters for the rail sector are also subject to the low-voltage directive.



Fig. 3: 40 Watt DC/DC converter for the rail sector

On the part of the terminal device manufacturer, it is often expected that even non-CE-required power supply components are certified in accordance with EN 62368-1 to reduce the testing effort for EN 62368-1-compliant terminal devices.

Which power supplies may be used in terminal devices that are currently already in the process of being certified according to EN 62368-1?

Like other manufacturers, the makers of power supplies are also affected by the certification bodies' limited testing resources. Even though the (re)certification according to EN 62368-1 has been in the works for years, especially for manufacturers with a large product portfolio the conversion of all products may not be completed until the effective date of 12/20/20. Traco Power's portfolio includes over 300 product families with more than 5000 individual products. Over 98% of these are being recertified (if recertification is obligatory). However, there are also other manufacturers who use this deadline to streamline their product portfolios. This means that in most cases not all of the products are recertified, which may lead to difficulties for the users of these products when certifying the terminal device.

However, many terminal device manufacturers have already certified their terminal devices in accordance with EN 62368-1 or are in the process of doing so. For manufacturers, the question arises to what extent they can use power supplies that are currently (i.e., prior to 12/20/20) "only" certified according to EN 60950-1 but not yet according to the new EN 62368-1.

In this regard, the principle applies that power supplies for which Amendment 2 of the EN 60950-1 was also tested will be accepted by the certification bodies for use in EN 62368-1-mandatory terminal devices. Meaning, manufacturers who currently certify their terminal device according to EN 62368-1 will be able to use these power supplies without

problems. Whether Amendment 2 was also tested can be seen in the safety certificate, if one is published by the manufacturer.

<p>Note: When more than one factory, please report on page 2</p> <p>Ratings and principal characteristics</p>	<p>Windmill Industrial Estate Wexford, White Mill Road, Y35 YH66, Ireland</p> <p><input type="checkbox"/> Additional information on page 2</p> <p>See page 2</p>
<p>Trademark (if any)</p>	<p>TRACO POWER</p>
<p>Additional information (if necessary may also be reported on page 2)</p>	<p>Unit also complies with EN 60950-1 :2006 + A1:2010 + A2:2013 + A11:2009 + A12:2011</p>
<p>A sample of the product was tested and found to be in conformity with</p>	<p><input checked="" type="checkbox"/> Additional Information on page 2</p> <p>IEC 60950-1:2005 (Second Edition) + A1:2009 + A2:2013</p>

Fig. 4: Safety certificate for the Traco Power TIB product series with IEC/EN/UL 60950-1 conformity and the listed amendments

However, as of 12/20/20, these power supplies must also have the EN 62368-1 certificate. In this context, it should also be mentioned that the deadline of 12/20/20 refers to putting the product into circulation (EU import or availability on the market). For example, if the terminal device manufacturer received his EN 60950-1-certified power supplies prior to this deadline, the terminal device may also be used after 12/20/20. Thus, the terminal device manufacturer can sell terminal devices (with EN 62368-1 certification) that are equipped with an EN 60950-1 + Amendment 2 power supply even after 12/20/20, as long as this power supply was imported into the EU or sold within the EU prior to 12/20/20. In principle, this also makes it possible to accumulate a “transitional supply.”

Situation in other countries

It should be noted that different situations arise outside of Europe. For example, in North America the UL 60950 remains valid, i.e., the UL 62368-1 will only be obligatory in case of new certifications. Devices certified in accordance with the UL 60950 may also be put into circulation after 12/20/20.

There are also countries (e.g., China) where the new standard is not accepted at all. However, exceptions apply regarding the use of components (such as power supplies); these may also be used with an EN 62368-1 certificate in terminal devices with EN 60950-1 certification.

Summary and outlook

The replacement of standard EN 60950-1 affects terminal device manufacturers whose products are subject to the EU low-voltage directive and were previously certified according to the EN 60950-1. In Europe, the EN 60950-1 will become invalid as of 12/20/20. For terminal devices put into circulation after this deadline, the EN 62368-1 will generally become the standard for testing their safety.

Accordingly, power supplies that are used in such terminal devices also require certification in accordance with the EN 62368-1. However, this is only mandatory if the power supply is also subject to the EU low-voltage directive, which is usually the case for AC/DC switching power supplies but not for many DC/DC converters. Terminal device manufacturers can already use power supplies that were tested in accordance with EN 60950-1, Amendment 2 in their EN 62368-1-certified terminal devices.

For a proper assessment of the use of power supplies in the terminal device under consideration of the current and future standards situation, it is recommended that system developers contact the power supply manufacturer. Your regional Traco Power Sales Engineer is at your service.

Contact/questions:

Yves Elsasser, Traco Electronic AG, Sihlbruggstrasse 111, 6340 Baar, Switzerland

Phone: +41 43 311 45 11

Fax: 41 43 311 45 45

E-mail: y.elsasser@tracopower.com

Web: <http://www.tracopower.com>