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Power Supply Safety Reports and Certifications

One can find a great deal of information on a power supply by studying the manufacturer's datasheet and other technical articles, but sometimes more information is required for the actual installation. Where is this information? It is in the power supply's safety reports and certifications. Failure to review and follow these can cause delays when system certification is sought.

To keep this article simple, we will just review a product that is certified to IEC 60950-1.

Usually there are three main documents; the CB certificate, an IEC 60950-1 CB report and / or EN 60950-1 test certificate and of course for North America, the UL or CSA 60950-1 test report. Due to confidential information like schematics, full test reports are often restricted and may only be released with a non-disclosure agreement (NDA). Fortunately reproduction is allowed by the test houses for the relevant pages of the report.

Usually the CB test certificate, which should always accompany the CB test report, is just two or three pages. This is often public information and details the part numbers that have been certified, their input and output ratings along with the safety standard (including revisions and amendments). Its function is to give a quick snapshot of the product and to show if all the certifications are current. A product that has out of date certifications may only be suitable where the safety bodies have allowed the use of "grandfathering" for older systems, and will not be suitable for new designs or major system upgrades.

To reduce cost, many power supply manufacturers are using the CE Mark to indicate compliance with EN 60950-1 rather than pay for and maintain a separate EN 60950-1 test report and certificate. In this case the CB test certificate (and CB test report) will indicate that the product was "additionally evaluated to EN 60950-1". This is perfectly acceptable.

Even an abridged CB or UL 60950-1 test report (the full report may extend to over 300 pages) has useful information. The section "Engineering Conditions of Acceptability" has the all-important details for how the product should be used.

For example:

Are the outputs SELV? Those outputs that are not should be insulated or have their access restricted to ensure that an operator or service technician cannot receive an electric shock.

Do any outputs have hazardous energy levels? 240VA is considered potentially dangerous if a screwdriver or metallic item accidentally shorts them, and a cover should be installed to protect them. Metal watch straps have caused serious burns to car mechanics when they have shorted the positive battery terminal to the automobile body.

Is "field wiring" allowed? If not, any cabling has to be attached by trained personnel. Products like DIN rail power supplies do allow field wiring and do not have crimped wire terminations.

The maximum investigated branch circuit rating is given. This reflects the size of the circuit breaker that was used during the safety testing, particularly when abnormal tests were performed.

The investigated Pollution Degree rating is stated. A rating of 2 is normal for office or laboratory equipment. That product should not be used where a pollution degree of 4 is required for an outside application where it may be subject to rainfall.

Proper bonding to the end-product main protective earthing termination is listed as required or not required. Failure to correctly earth the product can result in electric shock.

The temperature class of any magnetic component components is given. Usually this is Class A (105°C) and system testing should check to make sure that is not exceeded under worse case conditions.

“The following end-product enclosures are required:” Here the types of enclosures are indicated for mounting the power supply in. If an open frame power supply is being used, the report will state that it has to be housed in an enclosure.

Other notes may be listed, like product orientation.

Many power supply companies are now posting this information on their website, along with the CE D of C (Declaration of Conformity); even some distributors are doing this too. The recent surge of amendments to the standards though is keeping many webmasters busy!

Posted by [Power Guy](#)