

DECISION SHEET

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| Standard(s): IEC 60950 (1999) 3rd Ed. IEC 60950-1 (2001) 1st ed. | Sub clause(s): 5.1.2, last paragraph 5.1 | Sheet n°: 394A |
| Subject: TOUCH CURRENT for equipment having multiple supplies supplying power simultaneously | Key words: - TOUCH CURRENT for equipment with multiple supplies | Decision taken at the 41st CTL meeting 2004. This decision replaces n. 394 taken at the 39th CTL meeting 2002 |
| <p>Question:</p> <ol style="list-style-type: none"> 1. Should the TOUCH CURRENT be measured for each individual supply source to determine if the PROTECTIVE CONDUCTOR CURRENT exceeds 3.5 mA and if it does exceed, then require PERMANENT or PLUGGABLE TYPE B connection to the supply and meet 5.1.7? 2. Should the cumulative TOUCH CURRENT be measured to determine if the total TOUCH CURRENT exceeds 3.5 mA? If the total TOUCH CURRENT does exceed 3.5 mA then require that AC MAINS SUPPLY to be connected to separate AC MAINS SUPPLY circuits with at least one source having a reliable connection to PROTECTIVE EARTH (e.g. be PLUGGABLE TYPE B or PERMANENTLY connected EUT? <p>Rationale:</p> <p>PLUGGABLE EQUIPMENT TYPE A does not have a reliable connection to building PROTECTIVE EARTH. Therefore, if the TOUCH CURRENT measurement exceeds 3.5 mA, then that particular source needs to be PERMANENTLY connected or have a PLUGGABLE TYPE B connection to PROTECTIVE EARTH. In older buildings, EARTH may not be present on the PLUGGABLE TYPE A socket outlets on the wall. The multiple connection does not help, as all such socket outlets may not have EARTH connection. Therefore, if the individual or cumulative PROTECTIVE CONDUCTOR CURRENT exceeds 3.5 mA, then at least one of the sources needs to be PERMANENTLY connected or have a PLUGGABLE TYPE B connection to PROTECTIVE EARTH. If one of the sources is required to be PERMANENTLY connected or have a PLUGGABLE TYPE B connection to PROTECTIVE EARTH in order to comply with the TOUCH CURRENT requirements, the equipment shall be provided with both a marking on the equipment and a statement in the installation instructions, specifying that the USER is to disconnect all power sources connection before disconnecting the PERMANENT connection or the PLUGGABLE TYPE B connection</p> <p>Decision:</p> <p>See copy of the CDV for IEC 60950-1 2nd edition on Page 2</p> | | |

5.1.2 Configuration of equipment under test (EUT)

5.1.2.1 Single connection to an a.c. mains supply

Systems of interconnected equipment with individual connections to the AC MAINS SUPPLY shall have each piece of equipment tested separately. Systems of interconnected equipment with one common connection to the AC MAINS SUPPLY shall be treated as a single piece of equipment. See also 1.4.10 regarding the inclusion of optional features.

NOTE Systems of interconnected equipment are specified in more detail in Annex A of IEC 60990.

5.1.2.2 Redundant multiple connections to an a.c. mains supply

Equipment which is designed for multiple connections to the AC MAINS SUPPLY, only one of which is required at a time, shall be tested with only one connection.

5.1.2.3 Simultaneous multiple connections to an a.c. mains supply

Equipment requiring power simultaneously from two or more AC MAINS SUPPLIES shall be tested with all AC MAINS SUPPLIES connected.

The total TOUCH CURRENT through all PROTECTIVE EARTHING CONDUCTORS that are connected to each other and to earth is measured.

A PROTECTIVE EARTHING CONDUCTOR that is not connected within the equipment to other earthed parts in the equipment shall not be included in the above tests. If an a.c. power source has such a PROTECTIVE EARTHING CONDUCTOR it shall be tested separately according to 5.1.2.1.

5.1.7 Equipment with touch current exceeding 3,5 mA

5.1.7.1 General

TOUCH CURRENT measurement results exceeding 3,5 mA r.m.s. are permitted for the following equipment having a main protective earthing terminal:

STATIONARY PERMANENTLY CONNECTED EQUIPMENT;

STATIONARY PLUGGABLE EQUIPMENT TYPE B;

STATIONARY PLUGGABLE EQUIPMENT TYPE A with a single connection to the AC MAINS SUPPLY, and provided with a separate protective earthing terminal in addition to the main protective earthing terminal, if any (see 2.6.4.1). The installation instructions shall specify that this separate protective earthing terminal be permanently connected to earth;

PLUGGABLE EQUIPMENT TYPE A for use in a RESTRICTED ACCESS LOCATION, with a single connection to the AC MAINS SUPPLY, and provided with a separate protective earthing terminal in addition to the main protective earthing terminal, if any (see 2.6.4.1). The installation instructions shall specify that this separate protective earthing terminal be permanently connected to earth;

STATIONARY PLUGGABLE EQUIPMENT TYPE A with simultaneous multiple connections to the AC MAINS SUPPLY, intended to be used in a location having equipotential bonding (such as a telecommunication centre, a dedicated computer room or a RESTRICTED ACCESS LOCATION). A separate additional protective earthing terminal shall be provided on the equipment. The installation instructions shall require all of the following.

- The building installation shall provide a means for connection to protective earth.
- The equipment is to be connected to that means.
- A SERVICE PERSON shall check whether or not the socket-outlet from which the equipment is to be powered provides a connection to the building protective earth. If not, the SERVICE PERSON shall arrange for the installation of a PROTECTIVE EARTHING CONDUCTOR from the separate protective earthing terminal to the protective earth wire in the building.

NOTE 1 In Finland, Norway and Sweden, TOUCH CURRENT measurement results exceeding 3,5 mA r.m.s. are permitted only for the following equipment:

- STATIONARY PLUGGABLE EQUIPMENT TYPE A that
 - is intended to be used in a RESTRICTED ACCESS LOCATION where equipotential bonding has been applied, for example, in a telecommunication centre; and
 - has provision for a permanently connected PROTECTIVE EARTHING CONDUCTOR; and
 - is provided with instructions for the installation of that conductor by a SERVICE PERSON;
- STATIONARY PLUGGABLE EQUIPMENT TYPE B;
- STATIONARY PERMANENTLY CONNECTED EQUIPMENT.

NOTE 2 In Denmark, TOUCH CURRENT measurement results exceeding 3,5 mA r.m.s. are permitted only for PERMANENTLY CONNECTED EQUIPMENT and PLUGGABLE EQUIPMENT TYPE B.

If the result of the TOUCH CURRENT measurement on any of the above equipments exceeds 3,5 mA r.m.s., the following requirements a) and b) apply, and also if relevant those in 5.1.7.2.

- a) The r.m.s. PROTECTIVE CONDUCTOR CURRENT shall not exceed 5 % of the input current per line under normal operating conditions. If the load is unbalanced, the largest of the three line currents shall be used for this calculation.
- To measure the PROTECTIVE CONDUCTOR CURRENT, the procedure for measuring TOUCH CURRENT is used but the measuring instrument is replaced by an ammeter of negligible impedance; and
- b) One of the following labels, or a label with similar wording, shall be affixed adjacent to the equipment AC MAINS SUPPLY connection:

WARNING
HIGH LEAKAGE CURRENT
EARTH CONNECTION ESSENTIAL
BEFORE CONNECTING SUPPLY

WARNING
HIGH TOUCH CURRENT
EARTH CONNECTION ESSENTIAL
BEFORE CONNECTING SUPPLY

NOTE Attention is drawn to IEC 60364-7-707.

Compliance is checked by inspection and measurement.

5.1.7.2 Simultaneous multiple connections to the supply

The following applies to EUT tested in accordance with 5.1.2.3. If the result of the total TOUCH CURRENT measurement exceeds 3,5 mA r.m.s., the test is repeated with each AC MAINS SUPPLY and its PROTECTIVE EARTHING CONDUCTOR connected one at a time, with the other AC MAINS SUPPLIES, including their PROTECTIVE EARTHING CONDUCTORS, disconnected. However, if two connections to the AC MAINS SUPPLY are inseparable, for example, connections for a motor and its control circuits, they shall both be energized for a repeat test.

NOTE It is not expected that the EUT will operate normally during this test.

If the result of the TOUCH CURRENT measurement for any of the repeat tests exceeds 3,5 mA r.m.s., the requirements of 5.1.7.1 a) apply to that connection to the AC MAINS SUPPLY. For calculating 5 % of the input current per line, the input current from the AC MAINS SUPPLY, measured during the repeat test, is used.