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Shielding and bonding for cables between buildings

Recommendation ITU-T K.73

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Recommendation ITU-T K.73

Shielding and bonding for cables between buildings

Summary

Bonding and earthing of telecommunication installations is done for reliability and personnel safety reasons. The evolution of the power architecture of telecommunication systems has created new installation conditions for equipment. To cover these situations, bonding and earthing configurations need to be defined to ensure that adequate reliability and safety are maintained.

Recommendation ITU-T K.73 analyses the situation in which equipment, connected together, is installed in different buildings with different earthing and power feeding conditions.

This Recommendation also includes installation requirements for equipment located in different buildings, having the same earthing and feeding power conditions, to improve the shielding and bonding of telecommunication and power cable between buildings.

Other Recommendations dealing with bonding and earthing are Recommendation ITU-T K.27, Bonding configurations and earthing inside a telecommunication building, Recommendation ITU-T K.35, Bonding configurations and earthing at remote electronic sites and Recommendation ITU-T K.66, Protection of customer premises from overvoltages. These Recommendations do not cover how equipment installed in these different environments can be interconnected.

Source

Recommendation ITU-T K.73 was approved on 13 April 2008 by ITU-T Study Group 5 (2005-2008) under Recommendation ITU-T A.8 procedure.

FOREWORD

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The approval of ITU-T Recommendations is covered by the procedure laid down in WTSA Resolution 1.

In some areas of information technology which fall within ITU-T's purview, the necessary standards are prepared on a collaborative basis with ISO and IEC.

NOTE

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Introduction

The equipment installed inside a building is generally connected to the earthing system of the building and can be also connected to other equipment inside or outside the building.

The outdoors mains distribution network serving a building can be a TN (TN-S or TN-C), TT or IT system; but the a.c. power distribution inside the building may be different depending on the customer needs.

A d.c. power distribution inside a building can be an "isolated d.c. return" system or a "d.c. return common" system.

To cover these different distribution situations, bonding and earthing configurations need to be defined to ensure that adequate reliability and safety are maintained. This Recommendation has the following objectives:

- 1) contribute to safety by reducing potential differences between telecommunications equipment units and earthed systems;
- 2) mitigate damage caused by lightning and other surges on the mains and telecommunications cables;
- 3) allow rapid de-energization of power lines that accidentally contact telecommunications equipment or cables, thereby reducing hazards and damage;
- 4) provide paths to divert to earth the surge currents entering the premises on cable screens;
- 5) provide a low-resistance circuit to earth for systems that use signalling with earth return.

This Recommendation requires the connection to the main earthing terminal of the following elements:

- both ends of metallic cable screens, if high unbalanced currents are expected due to different earthing potentials. Precautions should be taken to limit such currents;
- conductive parts of entry, distribution and termination points, including metallic cabinets, covers and other metallic parts of the cable management system.

In this Recommendation, the term "different earthing and power feeding conditions" means that each building is fed by an outdoor mains distribution and the earthing systems of each building are not intentionally connected, regardless of both the distance or the power feeding conditions.

In this Recommendation, the term "same earthing and power feeding conditions" means that there is only one outdoor mains distribution and only one earthing system for all buildings.

Recommendation ITU-T K.73

Shielding and bonding for cables between buildings

1 Scope

This Recommendation provides bonding configurations and earthing for telecommunication equipment installed inside different buildings in the following cases:

- 1) buildings with different earthing and power feeding conditions;
- 2) buildings with the same earthing and power feeding conditions.

This Recommendation:

- is intended to facilitate the internetworking between different equipment (interconnected by metallic links);
- can be used for new installations and, if possible, for the expansion and replacement of the existing installations;
- is not intended to replace national regulations on bonding and earthing.

The user should refer to [ITU-T K.27] for bonding configurations and earthing inside the telecommunication building; to [ITU-T K.35] for bonding configurations and earthing at remote sites; to [ITU-T K.66] for bonding and earthing of telecommunication installations inside a customer premises.

Bonding requirements between a building and an adjacent tower are outside the scope of this Recommendation.

NOTE – In this case, the user should refer to [b-ITU-T K.47], [b-ITU-T K.56] and [ITU-T K.71].

2 References

The following ITU-T Recommendations and other references contain provisions which, through reference in this text, constitute provisions of this Recommendation. At the time of publication, the editions indicated were valid. All Recommendations and other references are subject to revision; users of this Recommendation are therefore encouraged to investigate the possibility of applying the most recent edition of the Recommendations and other references listed below. A list of the currently valid ITU-T Recommendations is regularly published. The reference to a document within this Recommendation does not give it, as a stand-alone document, the status of a Recommendation.

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| [ITU-T K.27] | Recommendation ITU-T K.27 (1996), <i>Bonding configurations and earthing inside a telecommunication building</i> . |
| [ITU-T K.35] | Recommendation ITU-T K.35 (1996), <i>Bonding configurations and earthing at remote electronic site</i> . |
| [ITU-T K.66] | Recommendation ITU-T K.66 (2004), <i>Protection of customer premises from overvoltages</i> . |
| [ITU-T K.71] | Recommendation ITU-T K.71 (2007), <i>Protection of customer antenna installations</i> . |
| [EN 50174-2] | EN 50174-2 (2001), <i>Information technology – Cabling installation. Part 2: Installation planning and practices inside buildings</i> .
< http://www.cenelec.eu/Cenelec/Code/Frameset.aspx > |
| [EN 50174-3] | EN 50174-3 (2003), <i>Information technology – Cabling installation. Part 3: Installation planning and practices outside buildings</i> .
< http://www.cenelec.eu/Cenelec/Code/Frameset.aspx > |