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SERIES K: PROTECTION AGAINST INTERFERENCE

Lightning protection and earthing of a miniature base station

Recommendation ITU-T K.120



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Summary

Recommendation ITU-T K.120 provides guidelines for lightning protection and earthing of miniature base stations. A miniature base station is a new type of radio base station, which is different from a distribution base station (DBS) in many respects. The change of installation environment is the critical factor to affect the lightning protection of miniature base stations.

Miniature base stations have low radio frequency (RF) power and a small volume in size, which makes them suitable for the coverage of hotspots and/or blind areas for improving communication quality. Miniature base stations are ordinarily installed in residential or densely populated urban areas (unconventional telecommunication site), for example, ceiling (indoor), external wall, advertising board, rooftop, street light, low-voltage power pole, and so on, where the installation, wiring and earthing is difficult.

In comparison, distribution base stations, within the domain of macro-base stations, have high RF power and a large volume in size, which is suitable for wide area coverage. Usually a DBS is installed in a conventional telecommunication environment, where the installation, wiring and earthing is easier. Though some installation scenarios are covered by Recommendation ITU-T K.97, lightning protection of miniature base stations are not fully specified in the ITU-T K series of Recommendations.

The purpose of this Recommendation is to give guidance on the protection of miniature base stations against lightning surge, especially for those which are in unexposed environments (to lightning) and unconventional telecommunication sites.

Protection of miniature base stations is achieved by either surge protective devices and/or components or isolation of interfaces. For those where earthing is not available or it is difficult, the base station can be unearthed (floating), as long as the safety measures against electric shock are considered adequately. Bonding configurations of the protection module and of the optical fibre cable are also illustrated.

History

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Lightning, miniature base station, surge, unconventional telecommunication site, unexposed environment (to lightning),

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FOREWORD

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The World Telecommunication Standardization Assembly (WTSA), which meets every four years, establishes the topics for study by the ITU-T study groups which, in turn, produce Recommendations on these topics.

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

In this Recommendation, the expression "Administration" is used for conciseness to indicate both a telecommunication administration and a recognized operating agency.

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Recommendation ITU-T K.120

Lightning protection and earthing of a miniature base station

1 Scope

This Recommendation addresses the lightning protection, earthing, bonding and safety considerations for miniature base stations.

The purpose of this Recommendation is to give guidance on the protection of miniature base stations against lightning surge, especially those which are in unexposed environments (to lightning) and unconventional telecommunication sites.

For miniature wireless stations installed in conventional telecommunication sites or highly exposed environments (to lightning), [ITU-T K.97] is applicable.

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.

- [ITU-T K.21] Recommendation ITU-T K.21 (2016), *Resistibility of telecommunication equipment installed in customer premises to overvoltages and overcurrents.*
- [ITU-T K.27] Recommendation ITU-T K.27 (2015), *Bonding configurations and earthing inside a telecommunication building.*
- [ITU-T K.45] Recommendation ITU-T K.45 (2016), *Resistibility of telecommunication equipment installed in the access and trunk networks to overvoltages and overcurrents.*
- [ITU-T K.56] Recommendation ITU-T K.56 (2010), *Protection of radio base stations against lightning discharges.*
- [ITU-T K.71] Recommendation ITU-T K.71 (2007), *Protection of customer antenna installations.*
- [ITU-T K.97] Recommendation ITU-T K.97 (2014), *Lightning protection of distributed base stations.*
- [ITU-T K.109] Recommendation ITU-T K.109 (2015), *Installation of telecommunication equipment on utility poles.*
- [ITU-T K.112] Recommendation ITU-T K.112 (2015), *Lightning protection, earthing and bonding: Practical procedures for radio base stations.*
- [IEC 61643-11] IEC 61643-11 (2011), *Low-voltage surge protective devices – Part 11: Surge protective devices connected to low-voltage power systems – Requirements and test methods.*
- [IEC 62305-1] IEC 62305-1 (2010), *Protection against lightning – Part 1: General principles.*
- [IEC 62305-2] IEC 62305-2 (2010), *Protection against lightning – Part 2: Risk management.*