

International Telecommunication Union

ITU-T

TELECOMMUNICATION
STANDARDIZATION SECTOR
OF ITU

K.123

(12/2016)

SERIES K: PROTECTION AGAINST INTERFERENCE

Electromagnetic compatibility requirements for electrical equipment in telecommunication facilities

Recommendation ITU-T K.123



International
Telecommunication
Union
Documents

Document Sharing Hub

Downloaded from ITU-T K.123 2016

Recommendation ITU-T K.123

Electromagnetic compatibility requirements for electrical equipment in telecommunication facilities

Summary

Recommendation ITU-T K.123 describes the requirements for radiated and conducted emissions from electrical systems installed in telecommunication facilities. Electrical systems in the scope of this Recommendation include rectifiers that supply direct current (DC) voltages of up to 400 V, power conditioning systems (PCSs) including grid connected power converters (GCPCs), uninterruptible power supplies (UPSs) and inverter driven electrical equipment including the air conditioners needed for the operation of telecommunication systems. Their electrical systems include power conversion devices and may generate conducted and radiated electromagnetic disturbances and cause degradation of the performance of telecommunication systems.

History

Edition	Recommendation	Approval	Study Group	Unique ID*
1.0	ITU-T K.123	2016-12-14	5	11.1002/1000/13139

Keywords

Conducted emission, electrical system, power conversion device, radiated emission, telecommunication facility.

* To access the Recommendation, type the URL <http://handle.itu.int/> in the address field of your web browser, followed by the Recommendation's unique ID. For example, <http://handle.itu.int/11.1002/1000/11830-en>.

FOREWORD

The International Telecommunication Union (ITU) is the United Nations specialized agency in the field of telecommunications, information and communication technologies (ICTs). The ITU Telecommunication Standardization Sector (ITU-T) is a permanent organ of ITU. ITU-T is responsible for studying technical, operating and tariff questions and issuing Recommendations on them with a view to standardizing telecommunications on a worldwide basis.

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.

Compliance with this Recommendation is voluntary. However, the Recommendation may contain certain mandatory provisions (to ensure, e.g., interoperability or applicability) and compliance with the Recommendation is achieved when all of these mandatory provisions are met. The words "shall" or some other obligatory language such as "must" and the negative equivalents are used to express requirements. The use of such words does not suggest that compliance with the Recommendation is required of any party.

INTELLECTUAL PROPERTY RIGHTS

ITU draws attention to the possibility that the practice or implementation of this Recommendation may involve the use of a claimed Intellectual Property Right. ITU takes no position concerning the evidence, validity or applicability of claimed Intellectual Property Rights, whether asserted by ITU members or others outside of the Recommendation development process.

As of the date of approval of this Recommendation, ITU had not received notice of intellectual property, protected by patents, which may be required to implement this Recommendation. However, implementers are cautioned that this may not represent the latest information and are therefore strongly urged to consult the TSB patent database at <http://www.itu.int/ITU-T/ipr/>.

© ITU 2017

All rights reserved. No part of this publication may be reproduced, by any means whatsoever, without the prior written permission of ITU.

Table of Contents

		Page
1	Scope.....	1
2	References.....	1
3	Definitions	2
3.1	Terms defined elsewhere	2
3.2	Terms defined in this Recommendation.....	3
4	Abbreviations and acronyms	3
5	Conventions	4
6	Connection of equipment in telecommunication centre	4
7	Emissions from 150 kHz to 6 GHz.....	5
7.1	Test methods and limits	5
7.2	Operational conditions.....	7
7.3	Test configuration.....	8
8	Guidance on noise other than emissions from 150 kHz to 6 GHz.....	10
8.1	Requirements for harmonic currents and voltage change on AC input ports	10
8.2	Noise on DC output port.....	10
8.3	Noise on AC output ports	10
	Bibliography.....	11

Introduction

Recently, an increasing number of electrical devices that involve high power switching circuits have been installed in telecommunication facilities. These include rectifiers that supply DC voltages up to 400 V, power conditioning systems (PCSs) including grid connected power converters (GCPCs), uninterruptible power supplies (UPSs) and air conditioners. Moreover, the power dealt with in these electrical devices has been increasing with their increase in number and the consumption requirements of telecommunication equipment installed in a facility, in accordance with the growth of information and communication technology (ICT) companies. Therefore, the possibility of interference with telecommunication systems due to emissions from these electrical systems is increasing.

Even though [ITU-T K.48] specifies emission requirements for telecommunication equipment, including power equipment, such as rectifier units, UPSs and DC distribution systems, the emission requirements for electrical systems that are not integral parts of telecommunication systems are not clearly specified in the Recommendation.

[CISPR 11] specifies emission requirements for switching power equipment, however, it does not specify requirements above 1 GHz. Also, the emission level limit in [CISPR 11] from photovoltaic power generating systems with a rated power from 20 kVA to 75 kVA is about 20 dB higher than the requirements for the telecommunication equipment regulated in [CISPR 32].

The systems installed in a telecommunication centre are sensitive to electromagnetic disturbances, since their immunity is designed and tested to meet the requirements of the controlled electromagnetic environment of the centre. Therefore, the telecommunication systems are at risk of malfunction if large power appliances are installed in such centres without limiting their electromagnetic emissions appropriately.

Consequently, the limits of emission levels from electrical systems installed in telecommunication facilities should be the same as the levels required for class A equipment in [CISPR 32].