
Zahteve za odpornost opreme s telekomunikacijskim(-i) vhodom (vhodi)

Resistibility requirements for equipment having (a) telecommunication port(s)

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English version

**Resistibility requirements for equipment
having (a) telecommunication port(s)**

Exigences de tenue aux chocs
des équipements possédant
un (des) port(s) de télécommunication

Anforderungen zur Zerstörfestigkeit
von Einrichtungen mit
(einem Telekommunikationsanschluss)
Telekommunikationsanschlüssen

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This Technical Report was approved by CENELEC on 2005-12-09.

[SIST-TP CLC/TR 50450:2006](https://standards.iteh.ai/en/standards/SIST-TP-CLC/TR-50450:2006)

CENELEC members are the national electrotechnical committees of Austria, Belgium, Cyprus, the Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, the Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland and the United Kingdom.

CENELEC

European Committee for Electrotechnical Standardization
Comité Européen de Normalisation Electrotechnique
Europäisches Komitee für Elektrotechnische Normung

Central Secretariat: rue de Stassart 35, B - 1050 Brussels

Foreword

CENELEC Report R0BT-003:2000 had been established by a joint ad hoc working group, which was set up between CENELEC and ETSI in order to analyze the status quo in the field of standardization concerning resistibility. The group was composed by experts from the following Technical Bodies within CENELEC and ETSI: CENELEC/SC 210A, CENELEC/TC 215, CENELEC/TC 81X, CENELEC/TC 74 and ETSI/TC ERM (EMC-WG).

NOTE CENELEC/TC 74 has been transferred into CENELEC/TC 108 "Safety of electronic equipment within the fields of audio/video, information technology and communication technology" in 2002. CENELEC/SC 210A has been disbanded in 2003 and its work items were taken over by the parent committee TC 210.

Through BT decision D122/066 R0BT-003:2000 was assigned to TC 215 for re-publication as a CLC/TR. The technical contents has not been changed, however, editorial improvements have been made to update references to (draft) standards as well as to reflect changes in Technical (Sub-) Committee structure.

The text of the draft was submitted to the formal vote and was approved by CENELEC as CLC/TR 50450 on 2005-12-09.

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Introduction

As defined in the CENELEC/ETSI Report R0BT-001/ETR 238:1995 ¹⁾, resistibility of equipment shall be treated in the context of electromagnetic phenomena. In general resistibility is considered as a quality issue. Quality aspects are not explicitly addressed by the essential requirements of New Approach Directives of the European Union. Resistibility should be viewed as a consideration to be taken when designing a product for its intended installation or environment. Therefore, these aspects should be the object of specific standards.

1 Scope

This document is intended to act as guidance for technical committees with respect to:

- a) producing resistibility standards;
- b) identifying the relevant committees for preparing European resistibility standards.

Safety (electrical etc.) and EMC are excluded from the scope of this report.

2 References

This document makes reference to the following documents.

IEC 60050-161, *International Electrotechnical Vocabulary – Chapter 161: Electromagnetic compatibility*

IEC 60050-701, *International Electrotechnical Vocabulary – Chapter 701: Telecommunications, channels and networks*

CENELEC/ETSI R0BT-001/ETR 238 ¹⁾, *CENELEC/ETSI standardization programme for the development of Harmonized Standards related to Electro-Magnetic Compatibility (EMC) in the field of telecommunications*

Directive 89/336/EEC, *Council Directive of 3 May 1989 on the approximation of the laws of the Member States relating to Electromagnetic Compatibility*

Directive 99/5/EC, *Directive 99/5/EC of the European Parliament and of the Council relating Radio Equipment and Telecommunications Terminal Equipment and the Mutual Recognition of their Conformity*

Directive 98/13/EC, *Directive 98/13/EC of the European Parliament and of the Council of 12 February 1998 relating to telecommunications terminal equipment and satellite earth station equipment, including the mutual recognition of their conformity*

3 Definitions and abbreviations

3.1 Definitions

For the purposes of this report the following definitions apply.

3.1.1

immunity (to a disturbance)

the ability of a device, equipment or system to perform without degradation in the presence of an electromagnetic disturbance

[IEC 60050-161:1990, 161-01-20]

3.1.2

resistibility

the ability of telecommunication equipment or a network to withstand, in general without damage, the effects of certain electrical, magnetic and electromagnetic phenomena up to a certain, specified extent, and in accordance with a specified criterion

¹⁾ The future designation of this document is presently being discussed by CLC/TC 210.

3.1.3

telecommunication

any transmission, emission or reception of signs, signals, writing, images and sounds or intelligence of any nature by wire, radio, optical or other electromagnetic systems
[IEC 60050-701:1988, 701-01-05]

3.1.4

telecommunication network

a transmission medium intended for communication between equipments that may be located in separate buildings.

NOTE 1 The term telecommunication network is defined in terms of its functionality, not its electrical characteristics.

NOTE 2 A telecommunication network may be

- publicly or privately owned;
- subject to transient overvoltages due to atmospheric discharges and faults in power distribution systems;
- subject to permanent longitudinal (common mode) voltages induced from nearby power lines or electric traction lines.

NOTE 3 Examples of telecommunication networks are:

- a public switched telephone network;
- a public data network;
- an ISDN network;
- a private network with electrical interface characteristics similar to the above.

3.1.5

telecommunication port

port which is intended to be connected to telecommunication networks, Local Area Networks (e.g. Ethernet, Token Ring) and similar networks, either through physical connection (cable optical fibre) or radio connection

NOTE In the latter case the antenna port is the telecommunication port.

3.2

Abbreviations

EMC	Electromagnetic compatibility
ESD	Electrostatic discharge
LEMP	Lightning electromagnetic pulse
HEMP	High altitude electromagnetic pulse
RF	Radio frequency
TTE	Telecommunication terminal equipment
PSTTN	Public Switching and Transmission Telecommunication Network

4 Clarification of the term resistibility

This report considers resistibility (i.e. ability to withstand specified levels of electrical stress without being damaged in general) addressed to the needs of the whole of the telecommunication network, i.e. all types of networks, public and private, as well as any equipment installed in or connected to this network. The resistibility requirements are based on the following electromagnetic phenomena: lightning, power induction, earth potential rise, low-voltage power contact and electrostatic discharge.

It should be noted that the EMC Directive 89/336/EEC (and its successor, Directive 2004/108/EC, which will come into force in January 2007) does not contain resistibility requirements (but immunity and emission requirements). Therefore, resistibility should not be subject to regulation under the EMC Directive 89/336/EEC, the Codified Terminal Directive 98/13/EC or the Radio Equipment and Telecommunications Terminal Equipment (R&TTE) Directive 99/5/EC.

This clause provides for general clarification of the term "resistibility" of telecommunication equipment working within networks.

The term resistibility has both electrical aspects and economic implications:

a) Electrical aspects:

Resistibility is, like EMC, related to electromagnetic phenomena. It is essential not to mix up the resistibility of a product with its electrical safety (covered for instance by series EN 60950).

Some electromagnetic phenomena (e.g. ESD, surge) may have both immunity and resistibility aspects. The difference between immunity and resistibility is on the "performance criterion": resistibility allows for a loss of function without damages (damages are allowed only on the power contact test). Resistibility deals with damage and not with normal operation. Therefore the resistibility test levels for an electromagnetic phenomenon are in general different from the immunity test levels.

b) Economic implications:

The resistibility requirement of telecommunication equipment and systems also depend on economic aspects such as:

- 1) risk assessment (high repair costs of low protected equipment versus no repair costs of highly protected equipment, probability of occurrence of damaging electromagnetic phenomena);
- 2) intended application;
- 3) the mitigation methods in installations;
- 4) continuity of the service;
- 5) serviceability of the equipment (equipment installed in difficult to reach places, e.g. high mountains).

Due to these aspects it can be useful that the European resistibility standards recommend only one level of resistibility, whereas higher levels could be selected on the basis of aspects listed above by the manufacturer or the user of the equipment.

It is considered that resistibility standards have to be used in engineering practice together with standards offering system approaches, mitigation methods etc., in a consistent manner.

Table 1 summarizes how resistibility and mitigation methods can be managed with such a system approach.

In general, two different types of electromagnetic environments can be identified, which obviously require different measures depending on the kind and/or complexity of the telecommunication equipment attached or the installations concerned.

Table 1 - Management of resistibility and mitigation methods

Environment	Equipment and system	Managed by
Unexposed and/or controlled environment (Urban area in general)	<ul style="list-style-type: none"> • Equipment: minimum resistibility required • User may decide by himself on additional protective measures (risk assessment etc.) 	<ul style="list-style-type: none"> • Manufacturers • Users
Exposed and/or uncontrolled environment (Rural area in general)	<ul style="list-style-type: none"> • Equipment: minimum resistibility required • Recommended mitigation techniques installed in the installation or network • User may decide by himself on additional protective measures (risk assessment etc.) 	<ul style="list-style-type: none"> • Manufacturers • Operators or owners of the installation or the network • Users

5 Recommendations

The resistibility requirements of telecommunication equipment should be given in dedicated standards separated from the EMC (emission and immunity) standards. The resistibility standards should be prepared on the basis of the relevant ITU-T K Recommendations and, if necessary, a liaison to ITU-T Study Group 5 should be established.

ETSI, in particular WG „EMC“ of Technical Committee „ERM“, should take the responsibility in preparing resistibility standards for public switching and transmission network telecommunication (PSTTN) equipment, whereas CENELEC, in particular WG 3 of TC 210 in collaboration with WG 1 of TC 81X, should prepare resistibility standards for telecommunication terminal equipment (TTE).

Table 2 contains a summary of the recommendations that are addressed to the relevant Technical (Sub-) Committees of both CENELEC and ETSI, being in charge of standardization of telecommunications equipment and lines.

Table 2 - Summary of recommendations to Technical (Sub-)Committees of CENELEC and ETSI

	CENELEC				ETSI
	TC 210 (WG 3)	TC 210	TC 215	TC 81X (WG 1)	TC ERM (WG EMC)
Resistibility standard for PSTTN equipment					X
Resistibility standard for telecommunication terminal equipment	X	X ¹⁾		X	
Protection of telecommunication lines against lightning				X ²⁾	
Protection of telecommunication lines against induction from power and traction lines	X				
Description of both the controlled and uncontrolled environment	X		X	X	

1) For this aspect TC 210 should have the responsibility to prepare the resistibility standards in collaboration with TC 81X.

2) EN 50468 "Resistibility requirements to overvoltages and overcurrents due to lightning for equipment having telecommunication port" is under preparation.

6 Conclusions

Table 2 summarizes the more general conclusions outlined in this report.

In addition, the following advice should be considered:

- 1) As resistibility is a quality issue, it should not be considered in the context of regulation; therefore, resistibility standards are not intended to be notified in the Official Journal of the European Commission.
- 2) ETSI and CENELEC are invited to define resistibility requirements into separate resistibility standards for PSTTN (public switching and transmission telecommunication network) equipment and TTE (telecommunication terminal equipment) equipment respectively, taking due account of the ITU-T K-series Recommendations on this subject. If necessary, CENELEC and ETSI may send a liaison statement to ITU for collaboration in this field.
- 3) Resistibility requirements should be excluded from harmonized standards dealing with electrical safety and EMC (emission and immunity) requirements. Product committees should be instructed to remove resistibility requirements from both harmonized safety and EMC standards. For all other standards, product committees should refer to dedicated resistibility standards.
- 4) Resistibility standards should be used in engineering practice together with standards offering system approaches in a consistent manner; therefore mitigation methods as detailed by CENELEC/TC 81X and other relevant European Standards provided by CENELEC or ETSI should be considered.