

Safety requirements for radio transmitting equipment (IEC 60215:1987)

iTeh STANDARD PREVIEW
(standards.iteh.ai)

[SIST EN 60215:2001](https://standards.iteh.ai/catalog/standards/sist/67e6ce57-b40e-4e39-a0e0-1aaac26adc34/sist-en-60215-2001)

<https://standards.iteh.ai/catalog/standards/sist/67e6ce57-b40e-4e39-a0e0-1aaac26adc34/sist-en-60215-2001>

iTeh STANDARD PREVIEW
(standards.iteh.ai)

SIST EN 60215:2001

<https://standards.iteh.ai/catalog/standards/sist/67e6ce57-b40e-4e39-a0e0-1aaac26adc34/sist-en-60215-2001>

EUROPEAN STANDARD

EN 60 215

NORME EUROPEENNE

March 1989

EUROPÄISCHE NORM

UDC: 621.396:614.8

KEY WORDS: Radiocommunication; radio transmitter; safety requirements

ENGLISH VERSION

SAFETY REQUIREMENTS FOR RADIO TRANSMITTING
EQUIPMENT
(IEC 215 (1987) ed 3)

Règles de sécurité applicables aux
matériels d'émission radioélectrique
(CEI 215 (1987) ed 3)

Sicherheitsbestimmung für
Funksender
(IEC 215 (1987) Ausg. 3)

This European Standard was ratified by CENELEC on 6 December 1988. CENELEC members are bound to comply with the requirements of the CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration.

Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the CENELEC Central Secretariat or to any CENELEC member.

This European Standard exists in three official versions (English, French and German). A version in any other language made by translation under the responsibility of a CENELEC member into its own language and notified to CENELEC Central Secretariat has the same status as the official versions.

CENELEC members are the national electrotechnical committees of Austria, Belgium, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and United Kingdom.

ITeC STANDARD PREVIEW
(standards.iteh.ai)
CENELEC SIST EN 60215:2001
<https://standards.iteh.ai/catalog/standards/sist/67e6ce57-b40e-4e39-a0e0-1aaac26adc34/sist-en-60215-2001>

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

Central Secretariat: rue Bréderode 2, B-1000 Brussels

© CENELEC 1989 Copyright reserved to all CENELEC members

Ref. No. EN 60 215:1989 E

BRIEF HISTORY

The CENELEC Questionnaire Procedure performed for finding out whether or not IEC 215 (third edition - 1987) could be accepted without textual changes, has shown that no common modifications were necessary for the acceptance as European Standard (EN). The Reference Document was submitted to the CENELEC members for formal vote and acceptance by CENELEC.

TECHNICAL TEXT

The text of the International Standard IEC 215 (third edition - 1987) was approved by CENELEC on 6 December 1988 as a European Standard.

Annexes designated "normative" are part of the body of the standard. Annexes designated "informative" are given only for information.

In this European Standard, annex ZA is normative.

The following dates were fixed:

- date of announcement (doa) : 1989-07-01
- date of latest publication (dop) : 1989-07-01
- date of withdrawal of conflicting national standard (dow) : 1990-01-01

iTeh STANDARD PREVIEW
(standards.iteh.ai)

[SIST EN 60215:2001](https://standards.iteh.ai/catalog/standards/sist/67e6ce57-b40e-4e39-a0e0-1aaac26adc34/sist-en-60215-2001)

<https://standards.iteh.ai/catalog/standards/sist/67e6ce57-b40e-4e39-a0e0-1aaac26adc34/sist-en-60215-2001>

ANNEX ZA (normative)
(This Annex replaces Appendix A of IEC Publication 215)

OTHER INTERNATIONAL PUBLICATIONS QUOTED IN THIS STANDARD

When the international Publications has been modified by CENELEC common modifications (mod = modified by CENELEC common modifications) the relevant EN/HD applies.

IEC Publication:		EN/HD (issue date)
IEC Publication 65: (1985) (mod)	Safety Requirements for Mains Operated Electronic and Related Apparatus for Household and Similar General Use.	HD 195 S5 (09.88)
CEE Publication 1: (1976)		-
IEC Publication 68-2:	Basic Environmental Testing Procedures, Part 2: Tests. To be used in conjunction with IEC Publication 68-1 (1982): Part 1: General and Guidance.	HD 323 series
IEC Publication 112: (1979)	Method of Determining the Comparative and the Proof Tracking Indices of Solid Insulating Materials Under Moist Conditions.	HD 214 S2 (04.80)
IEC Publication 173: (1964)	Colours of the Cores of Flexibles Cables and Cords.	HD 27 S1 (09.78)
IEC Publication 244-1: (1968)	Methods of Measurement for Radio Transmitters, Part 1: General Conditions of Measurement, Frequency, Output Power and Power Consumption.	HD 236.1 S1 (05.77)
IEC Publication 417: (1973)	Graphical symbols for Use on Equipment. Index, Survey and Compilation of the Single Sheets.	HD 243 S7 (01.88)
IEC Publication 479:	Effects of Current Passing Through the Human Body.	-
IEC Publication 529: (1976)	Classification of Degrees of Protection Provided by Enclosures.	HD 365 S3 (05.85)
IEC Publication 536: (1976)	Classification of Electrical and Electronic Equipment with Regard to Protection Against Electric Shock.	HD 366 S1 (05.77)
IEC Publication 617:	Graphical Symbols for Diagrams.	-
IEC Publication 657: (1979)	Non-ionizing Radiation Hazards in the Frequency Range from 10 MHz to 300 000 MHz.	-
IEC Publication 695:	Fire Hazard Testing.	HD 444 series
ISO Standard 1999: (1975)	Acoustics — Assessment of Occupational Noise Exposure for Hearing Conservation Purposes.	-
ISO Standard 3864: (1984)	Safety Colours and Safety Signs.	-
Publication 15 of the I.C.R.P.: (1969)	Report of the Plenary Session of the International Commission for Radiological Protection, held in Philadelphia.	-
Publication of the W.H.O.: (1981)	World Health Organization: Environmental Health Criteria 16.	-

STANDARD PREVIEW
(standards.iteh.ai)

SIST EN 60215-2001
1aaac26adc34/sist-en-60215-2001

iTeh STANDARD PREVIEW
(standards.iteh.ai)

SIST EN 60215:2001

<https://standards.iteh.ai/catalog/standards/sist/67e6ce57-b40e-4e39-a0e0-1aaac26adc34/sist-en-60215-2001>

INTERNATIONAL STANDARD

IEC 60215

Third edition
1987

Safety requirements for radio transmitting equipment

iTeh STANDARD PREVIEW
(standards.iteh.ai)

[SIST EN 60215:2001](https://standards.iteh.ai/catalog/standards/sist/67e6ce57-b40e-4e39-a0e0-1aaac26adc34/sist-en-60215-2001)

<https://standards.iteh.ai/catalog/standards/sist/67e6ce57-b40e-4e39-a0e0-1aaac26adc34/sist-en-60215-2001>

© IEC 1987 Copyright - all rights reserved

No part of this publication may be reproduced or utilized in any form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from the publisher.

International Electrotechnical Commission, 3, rue de Varembé, PO Box 131, CH-1211 Geneva 20, Switzerland
Telephone: +41 22 919 02 11 Telefax: +41 22 919 03 00 E-mail: inmail@iec.ch Web: www.iec.ch



Commission Electrotechnique Internationale
International Electrotechnical Commission
Международная Электротехническая Комиссия

PRICE CODE

T

For price, see current catalogue

CONTENTS

	Page
FOREWORD	7
PREFACE	7
INTRODUCTION	9
Clause	
1. Scope	9
2. Object	9
SECTION ONE – TERMINOLOGY	
3. Definitions	11
SECTION TWO – CONDITIONS OF NORMAL USE AND FAULT CONDITIONS	
4. Introduction	13
5. Conditions of normal use	15
6. Fault conditions	15
SECTION THREE – COMPONENTS AND CONSTRUCTION	
7. Introduction	17
8. Components	17
9. Construction	19
10. Markings relevant to safety	21
SECTION FOUR – PROTECTION AGAINST HARMFUL ELECTRICAL SHOCK AND RADIO-FREQUENCY SKIN BURNS	
11. Introduction	21
12. Earthing	23
13. Enclosures	23
14. Mechanical considerations concerning safety devices	27
15. Wiring	27
16. Insulation	27
17. Voltages at the radio-frequency output connection	29
SECTION FIVE – HIGH TEMPERATURES, FIRE AND MISCELLANEOUS HAZARDS	
18. Introduction	29
19. High temperatures	29
20. Fire	31
21. Implosion and explosion	31
22. Harmful radiation	31
23. Dangerous materials	33
24. Dangerous short-circuiting of low voltage supplies	33

APPENDIX A — References to other publications	35
APPENDIX B — Clearances and creepage distances	37
APPENDIX C — Symbols	39
APPENDIX D — Guidance on assessing the competence of personnel for designation as skilled	43
APPENDIX E — Guidance on safety precautions to be observed by personnel working on radio transmitting equipment	45

iTeh STANDARD PREVIEW
(standards.iteh.ai)

SIST EN 60215:2001

<https://standards.iteh.ai/catalog/standards/sist/67e6ce57-b40e-4e39-a0e0-1aaac26adc34/sist-en-60215-2001>

INTERNATIONAL ELECTROTECHNICAL COMMISSION

**SAFETY REQUIREMENTS
FOR RADIO TRANSMITTING EQUIPMENT**

FOREWORD

- 1) The formal decisions or agreements of the IEC on technical matters, prepared by Technical Committees on which all the National Committees having a special interest therein are represented, express, as nearly as possible, an international consensus of opinion on the subjects dealt with.
- 2) They have the form of recommendations for international use and they are accepted by the National Committees in that sense.
- 3) In order to promote international unification, the IEC expresses the wish that all National Committees should adopt the text of the IEC recommendation for their national rules in so far as national conditions will permit. Any divergence between the IEC recommendation and the corresponding national rules should, as far as possible, be clearly indicated in the latter.

PREFACE

This standard has been prepared by Sub-Committee 12C: Transmitting Equipment, of IEC Technical Committee No. 12: Radiocommunications.

This third edition replaces the second edition of IEC Publication 215 (1978).

The text of this standard is based upon the following documents:

SIST EN 60215:2001

12C(CO)186	12C(CO)195
------------	------------

Full information on the voting for the approval of this standard can be found in the Voting Report indicated in the above table.

SAFETY REQUIREMENTS FOR RADIO TRANSMITTING EQUIPMENT

INTRODUCTION

This third edition of safety requirements for radio transmitting equipment supersedes, and replaces in a single volume, two earlier IEC Publications: 215 (1978) and 284 (1968).

The requirements and test methods in this standard are similar to those given in the second edition of IEC Publication 215 and continue to apply only to radio transmitting equipment operating under the responsibility of skilled personnel as defined in Sub-clause 3.1. The text of Appendix E is based on the contents of IEC Publication 284, which has now been withdrawn.

The titles of IEC publications and publications of other international bodies referred to in this standard are given in Appendix A.

1. Scope

This standard applies to radio transmitting equipment, including any auxiliary apparatus necessary for its normal operation as defined in IEC Publication 244-1, operating under the responsibility of skilled personnel. It applies to all radio transmitting equipment and ancillary apparatus, including combining units and matching networks. Only the antenna system and associated feeder lines are excluded.

This standard does not apply to transmitters of safety-insulated construction using double insulation or reinforced insulation and without provision for protective earthing.

This type of equipment is designated "Class II Equipment" in IEC Publication 536 and is usually marked with the symbol shown in Sub-clause C2.2 of Appendix C.

2. Object

This standard deals with protection against:

- electric shock;
- skin burns;
- high temperature and fire;
- implosion and explosion;
- harmful radiation;
- miscellaneous hazards.

Design and construction requirements and, where appropriate, test methods are specified covering:

- a) the safety of skilled personnel when operating, carrying out routine adjustments to, and as far as practicable, during fault finding and repairing the equipment;
- b) the safety of personnel, including unskilled personnel directed by skilled personnel, when the equipment is operating normally, and also when operating under certain specific fault conditions which may arise in normal use;
- c) the prevention of fire and its spread.

These requirements do not necessarily ensure the safety of unskilled personnel working on the equipment when it is not in normal operation.

Tests are specified, where appropriate, for checking that the equipment meets the safety requirements of this standard when operating normally and also under the specified fault conditions. The tests should be carried out on a representative set of equipment in order to determine whether the design meets the requirements of this standard. The tests are neither mandatory nor limiting and may be modified by agreement between manufacturer and purchaser.

The use of this standard is not, however, intended to be restricted to type tests. It may also be used for acceptance tests after installation of the equipment, for tests after modifications to parts of the equipment, and for tests at appropriate intervals to ensure the continuing safety of the equipment throughout its life.

SECTION ONE — TERMINOLOGY

3. Definitions

The following definitions apply for the purpose of this standard.

3.1 Skilled personnel

Personnel are considered to be skilled if they have the necessary knowledge and practical experience of electrical and radio engineering to appreciate the various hazards that can arise from working on radio transmitters, and to take appropriate precautions to ensure the safety of personnel.

Guidance on assessing the competence of personnel for designation as skilled is given in Appendix D.

Note. — The above definition and the guidance in Appendix D detail the minimum requirements for a skilled person. In some countries more stringent requirements for qualifications, training and experience are stipulated, with formal certification.

3.2 Electrically safe

A part is electrically safe if it cannot cause a harmful electric shock or radio-frequency skin-burn.

The conditions for a part to be electrically safe are:
either

- a) The voltage between the part and earth, and also between the part and any other accessible part, does not exceed 72 V peak when measured with an instrument having an internal resistance of not less than 10 k Ω per volt;
- or
- b) the voltage exceeds 72 V peak, but the following limits with regard to both current and capacity apply:

Current limits

Frequency	Current limit
d.c.	2 mA
< 1 kHz	0.7 mA (peak)
1 kHz to 100 kHz	0.7 <i>f</i> mA (peak)
> 100 kHz	70 mA (peak)

- Where the current is measured in a non-inductive resistor of 2 k Ω connected between the part concerned and earth or any other accessible part; and where *f* is the frequency in kilohertz.