



National Standards Authority of Ireland

IRISH STANDARD

I.S. HD 637 S1:1999

ICS 29.240

National Standards
Authority of Ireland
Glasnevin, Dublin 9
Ireland

Tel: +353 1 807 3800
Fax: +353 1 807 3838
<http://www.nsai.ie>

POWER INSTALLATIONS EXCEEDING 1 KV

Sales

<http://www.standards.ie>

A.C.

*This Irish Standard was
published under the authority
of the National Standards
Authority of Ireland and
comes into effect on:
December 24, 1999*

**NO COPYING WITHOUT NSAI
PERMISSION EXCEPT AS
PERMITTED BY COPYRIGHT
LAW**

© NSAI 1999

Price Code AE

Údarás um Chaighdeán Náisiúnta na hÉireann

This page is intentionally left BLANK.

HARMONIZATION DOCUMENT
DOCUMENT D'HARMONISATION
HARMONISIERUNGSDOKUMENT

HD 637 S1

May 1999

ICS 29.240.00

English version

Power installations exceeding 1 kV a.c.

Installations électriques de tensions
nominales supérieures à 1 kV en
courant alternatif

Starkstromanlagen mit
Nennwechselspannungen über 1 kV

This Harmonization Document was approved by CENELEC on 1999-01-01. CENELEC members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for implementation of this Harmonization Document on a national level.

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

This Harmonization Document exists in three official versions (English, French, German).

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

This Harmonization Document was prepared by the Technical Committee CENELEC TC 99X „Power Installations exceeding AC 1 kV (DC 1,5 kV)“.

The text of the draft was submitted to the formal vote and was approved by CENELEC as HD 637 S1 on 1999-01-01.

During the draft stage this standard was labelled prEN 50179; it is cited under this number in various other European Standards, such as EN 50110-1.

The purpose of this Harmonization Document is to provide, in a convenient form, general requirements for the design and the erection of electrical power installations in systems with nominal voltages above 1 kV a.c.

There are many national laws, standards and internal rules dealing with the matter coming within the scope of this standard and these practices have been taken as a basis for this work.

The standard and its normative and informative annexes identifies installation characteristics which represent the minimum attainable for all CENELEC countries under stated conditions. These characteristics ensure an acceptable reliability of an installation and its safe operation.

The standard is supplemented by an informative annex of A-deviations and a normative annex of Special National Conditions and National Provisions (part of national standards, specifications or practices). These annexes identify, as appropriate, where such minimum attainable characteristics require adjustments to take account of national legislation and/or the local environment.

This concept is believed to be a first decisive step to the gradual alignment in Europe of the practices concerning the design and erection of power installations.

The following dates were fixed:

- latest date by which the existence of the HD has to be announced at national level (doa) 1999-07-01
- latest date by which the HD has to be implemented at national level by publication of a harmonized national standard or by endorsement (dop) 2000-01-01
- latest date by which the national standards conflicting with the HD have to be withdrawn (dow) 2001-01-01

Annexes designated “normative” are part of the body of the standard.

Annexes designated “informative” are given for information only.

In this standard, annexes A to G and T are normative and annexes H to S and U are informative.

Table of Contents

FOREWORD	2
1 SCOPE AND NORMATIVE REFERENCES	8
2 DEFINITIONS	12
2.1 GENERAL DEFINITIONS	12
2.2 INSTALLATIONS	12
2.3 TYPES OF INSTALLATIONS	13
2.4 SAFETY MEASURES AGAINST ELECTRIC SHOCK	13
2.5 CLEARANCES	14
2.6 CONTROL AND PROTECTION	14
2.7 EARTHING	14
3 FUNDAMENTAL REQUIREMENTS	22
3.1 ELECTRICAL REQUIREMENTS	22
3.1.1 <i>Methods of neutral earthing</i>	22
3.1.2 <i>Voltage classification</i>	22
3.1.3 <i>Current in normal operation</i>	22
3.1.4 <i>Short circuit current</i>	22
3.1.5 <i>Rated frequency</i>	23
3.1.6 <i>Corona</i>	23
3.2 MECHANICAL REQUIREMENTS	23
3.2.1 <i>Tension load</i>	24
3.2.2 <i>Erection load</i>	24
3.2.3 <i>Ice load</i>	24
3.2.4 <i>Wind load</i>	24
3.2.5 <i>Switching forces</i>	24
3.2.6 <i>Short-circuit forces</i>	24
3.2.7 <i>Loss of conductor tension</i>	25
3.2.8 <i>Vibration</i>	25
3.2.9 <i>Dimensioning of supporting structures</i>	25
3.3 CLIMATIC AND ENVIRONMENTAL CONDITIONS	25
3.3.1 <i>Temperature</i>	25
3.3.2 <i>Altitude and air pressure</i>	26
3.3.3 <i>Humidity</i>	26
3.3.4 <i>Precipitation</i>	26
3.3.5 <i>Pollution</i>	26
3.3.6 <i>Solar radiation</i>	27
3.4 SPECIAL REQUIREMENTS	27
3.4.1 <i>Installations at high altitudes</i>	27
3.4.2 <i>Effects of small animals and microorganisms</i>	28
3.4.3 <i>Noise level</i>	28
3.4.4 <i>Effects of earthquakes</i>	28
4 INSULATION	29
4.1 SELECTION OF INSULATION LEVEL	29
4.2 VERIFICATION OF WITHSTAND VALUES	29
4.3 MINIMUM CLEARANCES OF LIVE PARTS	29
4.4 MINIMUM CLEARANCES BETWEEN PARTS UNDER SPECIAL CONDITIONS	32
4.5 TESTED CONNECTION ZONES	32
5 EQUIPMENT	33
5.1 COMMON RULES	33
5.1.1 <i>General</i>	33
5.1.2 <i>Installation</i>	33

5.2	SPECIFIC REQUIREMENTS.....	33
5.2.1	<i>Circuit-breakers, switch-disconnectors, fuses, fuse-switch disconnectors, contactors, disconnectors and earthing switches.....</i>	33
5.2.2	<i>Power transformers and reactors.....</i>	34
5.2.3	<i>Gas insulated metal-enclosed switchgear (GIS), metal-enclosed switchgear, insulation-enclosed switchgear, and other prefabricated type-tested switchgear assemblies.....</i>	34
5.2.4	<i>Instrument transformers.....</i>	35
5.2.5	<i>Surge arresters.....</i>	35
5.2.6	<i>Capacitors.....</i>	35
5.2.7	<i>Line traps.....</i>	36
5.2.8	<i>Insulators.....</i>	36
5.2.9	<i>Insulated cables.....</i>	36
5.2.10	<i>Conductors and accessories.....</i>	38
5.2.11	<i>Rotating machines.....</i>	38
5.2.12	<i>Static converters.....</i>	39
6	INSTALLATIONS.....	40
6.1	GENERAL REQUIREMENTS.....	40
6.1.1	<i>Circuit arrangement.....</i>	40
6.1.2	<i>Documentation.....</i>	40
6.1.3	<i>Transport routes.....</i>	41
6.1.4	<i>Aisles and access areas.....</i>	41
6.1.5	<i>Lighting.....</i>	41
6.1.6	<i>Operational safety.....</i>	42
6.1.7	<i>Labelling.....</i>	42
6.2	OPEN-TYPE OUTDOOR INSTALLATIONS.....	42
6.2.1	<i>Barrier clearances.....</i>	42
6.2.2	<i>Obstacle clearances.....</i>	43
6.2.3	<i>Boundary clearances.....</i>	43
6.2.4	<i>Minimum height over access area.....</i>	43
6.2.5	<i>Clearances to buildings.....</i>	43
6.2.6	<i>External fences and access doors.....</i>	44
6.3	OPEN-TYPE INDOOR INSTALLATIONS.....	44
6.4	INSTALLATION OF FACTORY-BUILT, TYPE-TESTED ENCLOSED SWITCHGEAR.....	45
6.4.1	<i>General.....</i>	45
6.4.2	<i>Additional requirements for gas-insulated metal-enclosed switchgear.....</i>	45
6.5	REQUIREMENTS FOR BUILDINGS.....	47
6.5.1	<i>Introduction.....</i>	47
6.5.2	<i>Structural provisions.....</i>	47
6.5.3	<i>Rooms for switchgear.....</i>	48
6.5.4	<i>Service areas.....</i>	48
6.5.5	<i>Doors.....</i>	48
6.5.6	<i>Draining of dielectric fluids.....</i>	49
6.5.7	<i>Air conditioning and ventilation.....</i>	49
6.5.8	<i>Buildings which require special consideration.....</i>	49
6.6	HIGH-VOLTAGE / LOW-VOLTAGE PREFABRICATED SUBSTATIONS.....	49
6.7	MAST, POLE AND TOWER INSTALLATIONS.....	49
7	SAFETY MEASURES.....	54
7.1	PROTECTION AGAINST DIRECT CONTACT.....	54
7.1.1	<i>General.....</i>	54
7.1.2	<i>Measures for protection against direct contact.....</i>	54
7.1.3	<i>Protection requirements.....</i>	55
7.2	MEANS TO PROTECT PERSONS IN CASE OF INDIRECT CONTACT.....	56

This is a free preview. Purchase the entire publication at the link below:

[Product Page](#)

-
- [Looking for additional Standards? Visit Intertek Inform Infostore](#)
 - [Learn about LexConnect, All Jurisdictions, Standards referenced in Australian legislation](#)
-