BS EN 61975:2010+A1:2017

BSI Standards Publication

High-voltage direct current (HVDC) installations — System tests

bsi.

National foreword

This British Standard is the UK implementation of EN 61975:2010+A1:2017. It is identical to IEC 61975:2010, incorporating amendment 1:2016. It supersedes BS EN 61975:2010 which will be withdrawn on 10 February 2020.

The start and finish of text introduced or altered by amendment is indicated in the text by tags. Tags indicating changes to IEC text carry the number of the IEC amendment. For example, text altered by IEC amendment 1 is indicated by [A1] 〈A1〉.

The UK participation in its preparation was entrusted to Technical Committee PEL/22, Power electronics.

A list of organizations represented on this committee can be obtained on request to its secretary.

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Compliance with a British Standard cannot confer immunity from legal obligations.

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Amendments/corrigenda issued since publication

Date	Text affected
30 April 2017	Implementation of IEC amendment 1:2016 with CENELEC endorsement A1:2017

EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN 61975:2010+A1

February 2017

ICS 29.130.10; 31.080.01

English version

High-voltage direct current (HVDC) installations - System tests
(IEC 61975:2010)

Installations en courant continu à haute tension (CCHT) - Essais système
(CEI 61975:2010)

Anlagen zur Hochspannungsgleichstromübertragung (HGÜ) - Systemprüfungen
(IEC 61975:2010)

CENELEC

European Committee for Electrotechnical Standardization
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Europäisches Komitee für Elektrotechnische Normung

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Foreword

The text of document 22F/221/FDIS, future edition 1 of IEC 61975, prepared by SC 22F, Power electronics for electrical transmission and distribution systems, of IEC TC 22, Power electronic systems and equipment, was submitted to the IEC-CENELEC parallel vote and was approved by CENELEC as EN 61975 on 2010-09-01.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN and CENELEC shall not be held responsible for identifying any or all such patent rights.

The following dates were fixed:

– latest date by which the EN has to be implemented at national level by publication of an identical national standard or by endorsement	(dop)	2011-06-01
– latest date by which the national standards conflicting with the EN have to be withdrawn	(dow)	2013-09-01

Annex ZA has been added by CENELEC.

Endorsement notice

The text of the International Standard IEC 61975:2010 was approved by CENELEC as a European Standard without any modification.

In the official version, for Bibliography, the following notes have to be added for the standards indicated:

IEC/TR 60919-1	NOTE	Harmonized as CLC/TR 60919-1.
IEC 61000-4-3	NOTE	Harmonized as EN 61000-4-3.
IEC 61803	NOTE	Harmonized as EN 61803.

Foreword to amendment A1

The text of document 22F/375/CDV, future IEC 61975:2010/A1, prepared by SC 22F “Power electronics for electrical transmission and distribution systems” of IEC/TC 22 “Power electronic systems and equipment” was submitted to the IEC-CENELEC parallel vote and approved by CENELEC as EN 61975:2010/A1:2017.

The following dates are fixed:

• latest date by which the document has to be implemented at national level by publication of an identical national standard or by endorsement	(dop)	2017-08-10
• latest date by which the national standards conflicting with the document have to be withdrawn	(dow)	2020-02-10

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The text of the International Standard IEC 61975:2010/A1:2016 was approved by CENELEC as a European Standard without any modification.

Annex ZA
(normative)

Normative references to international publications with their corresponding European publications

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

NOTE When an international publication has been modified by common modifications, indicated by (mod), the relevant EN/HD applies.

Publication	Year	Title	EN/HD	Year
IEC 60633	1998	Terminology for high-voltage direct current (HVDC) transmission	EN 60633	1999
IEC/TR 60919-2	2008	Performance of high-voltage direct current (HVDC) systems with line-commutated converters - Part 2: Faults and switching	CLC/TR 60919-2	201X[1)]

[1)] At draft stage.

CONTENTS

INTRODUCTION


The standard is structured in eight clauses:

Clause 1 – Scope

Clause 2 – Normative references

Clause 3 – Terms and definitions

Clause 4 – Objectives of system tests

This clause addresses the purpose of this standard, the HVDC system structure, the control and protection structure, the logical steps of commissioning, the structure of the system test and that of the system commissioning standard.

Clause 5 – Converter station test

This clause addresses the commissioning of converter units and verifies the steady state performance of units as well as switching tests.

Clause 6 – Power transmission tests

This clause concerns the commissioning of the transmission system, and verifies station coordination, steady-state and dynamic performance, interference, as well as interaction between the DC and AC systems.

Clause 7 – Trial operation

After completion of the system test, the period of trial operation is normally specified to verify the normal transmission.

Clause 8 – System test plan and documentation

Clauses 5 to 7 comprise individual sections providing an introduction and covering objectives, preconditions and procedures and general acceptance criteria as well as detailed descriptions of the individual tests. 

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HIGH-VOLTAGE DIRECT CURRENT (HVDC) INSTALLATIONS – SYSTEM TESTS

1 Scope

This International Standard applies to system tests for high-voltage direct current (HVDC) installations which consist of a sending terminal and a receiving terminal, each connected to an [A1] AC [A1] system.

The tests specified in this standard are based on bidirectional [A1] monopolar [A1] and bipolar high-voltage direct current (HVDC) installations which consist of a sending terminal and a receiving terminal, each connected to an [A1] AC [A1] system. The test requirements and acceptance criteria should be agreed for back-to-back installations, while multi-terminal systems and voltage sourced converters are not included in this standard. For monopolar HVDC installations, the standard applies except for bipolar tests.

For the special functions or performances that are claimed by specific projects, [A1] *Text deleted* [A1] extra test items not included in this standard should be added according to the technical specification requirements.

This standard only serves as a guideline to system tests for high-voltage direct current (HVDC) installations. The standard gives potential users guidance, regarding how to plan commissioning activities. The tests described in the guide may not be applicable to all projects, but represent a range of possible tests which should be considered.

Therefore, it is preferable that the project organization establishes the individual test program based on this standard and in advance assigns responsibilities for various tasks/tests between involved organisations (e.g. user, supplier, manufacturer, operator, purchaser etc.) for each specific project.

2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For [A1] undated [A1] references, the latest edition of the referenced document (including any amendments) applies.

IEC 60633:1998, *Terminology for high-voltage direct current (HVDC) power transmission*

IEC/TR 60919-2:2008, *Performance of high-voltage direct current (HVDC) systems with line commutated converters – Part 2: Faults and switching*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in IEC 60633 as well as the following terms and definitions apply.

3.1 Test classifications terms

3.1.1
[A1] **converter station tests**
converter station system test including items which verify the function of individual equipment of the converter station in energized state [A1]