SLOVENSKI STANDARD
SIST EN 60700-1:2015/A1:2022

01-marec-2022

Tiristorski ventili (elektronke) za visokonapetostni enosmerni prenos (HVDC) električne energije - 1. del: Električno preskušanje - Dopolnilo A1 (IEC 60700-1:2015/AMD1:2021)

Thyristor valves for high voltage direct current (HVDC) power transmission - Part 1: Electrical testing (IEC 60700-1:2015/AMD1:2021)

Thyristorventile für Hochspannungsgleichstrom-Energieübertragung (HGÜ) - Teil 1: Elektrische Prüfung (IEC 60700-1:2015/AMD1:2021)

Valves à thyristors pour le transport d'énergie en courant continu à haute tension (CCHT) - Partie 1: Essais électriques (IEC 60700-1:2015/AMD1:2021)

Ta slovenski standard je istoveten z: **EN 60700-1:2015/A1:2021**

ICS:

19.080	Električno in elektronsko preskušanje	Electrical and electronic testing
29.200	Usmerniki. Pretvorniki. Stabilizirano električno napajanje	Rectifiers. Convertors. Stabilized power supply
31.080.20	Tiristorji	Thyristors

SIST EN 60700-1:2015/A1:2022 **en,fr,de**

EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN 60700-1:2015/A1

October 2021

ICS 29.200

English Version

Thyristor valves for high voltage direct current (HVDC) power transmission - Part 1: Electrical testing (IEC 60700-1:2015/AMD1:2021)

Valves à thyristors pour le transport d'énergie en courant continu à haute tension (CCHT) - Partie 1: Essais électriques
(IEC 60700-1:2015/AMD1:2021)

Thyristorventile für Hochspannungsgleichstrom-Energieübertragung (HGÜ) - Teil 1: Elektrische Prüfung
(IEC 60700-1:2015/AMD1:2021)

This amendment A1 modifies the European Standard EN 60700-1:2015; it was approved by CENELEC on 2021-10-20. CENELEC members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this amendment 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 CEN-CENELEC Management Centre or to any CENELEC member.

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

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

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

CEN-CENELEC Management Centre: Rue de la Science 23, B-1040 Brussels

Ref. No. EN 60700-1:2015/A1:2021 E

European foreword

The text of document 22F/604/CDV, future IEC 60700-1/AMD1, 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 60700-1:2015/A1:2021.

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) 2022–07–20
- latest date by which the national standards conflicting with the document have to be withdrawn (dow) 2024–10–20

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

Any feedback and questions on this document should be directed to the users’ national committee. A complete listing of these bodies can be found on the CENELEC website.

Endorsement notice

The text of the International Standard IEC 60700-1:2015/AMD1:2021 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 documents are referred to in the text in such a way that some or all of their content constitutes requirements 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 1 Where an International Publication has been modified by common modifications, indicated by (mod), the relevant EN/HD applies.

NOTE 2 Up-to-date information on the latest versions of the European Standards listed in this annex is available here: www.cenelec.eu.

The Annex ZA of EN 60700-1:2015 applies with the following changes:

Publication	Year	Title	EN/HD	Year
Replace the following references:				
IEC 61803	1999	Determination of power losses in high-voltage direct current (HVDC)converter stations with line-commutated converters	EN 61803	1999
+A1	2010		+A1	2010
With the following new reference:				
IEC 61803	2020	Determination of power losses in high-voltage direct current (HVDC) converter stations with line-commutated converters	EN IEC 61803	2020
Replace the following reference, as well as the associated footnote:				
ISO/IEC Guide 25		General requirements for the technical competence of testing laboratories		
With the following new reference:				
ISO/IEC 17025	-	General requirements for the competence of testing and calibration laboratories	EN ISO/IEC 17025	-

IEC 60700-1

Edition 2.0 2021-09

INTERNATIONAL STANDARD

NORME INTERNATIONALE

AMENDMENT 1
AMENDEMENT 1

Thyristor valves for high voltage direct current (HVDC) power transmission – Part 1: Electrical testing

Valves à thyristors pour le transport d'énergie en courant continu à haute tension (CCHT) – Partie 1: Essais électriques

INTERNATIONAL ELECTROTECHNICAL COMMISSION

COMMISSION ELECTROTECHNIQUE INTERNATIONALE

ICS 29.200

ISBN 978-2-8322-1012-9

INTERNATIONAL ELECTROTECHNICAL COMMISSION

_____

THYRISTOR VALVES FOR HIGH VOLTAGE DIRECT CURRENT (HVDC) POWER TRANSMISSION –

Part 1: Electrical testing

AMENDMENT 1

FOREWORD

1) The International Electrotechnical Commission (IEC) is a worldwide organization for standardization comprising all national electrotechnical committees (IEC National Committees). The object of IEC is to promote international co-operation on all questions concerning standardization in the electrical and electronic fields. To this end and in addition to other activities, IEC publishes International Standards, Technical Specifications, Technical Reports, Publicly Available Specifications (PAS) and Guides (hereafter referred to as "IEC Publication(s)"). Their preparation is entrusted to technical committees; any IEC National Committee interested in the subject dealt with may participate in this preparatory work. International, governmental and non-governmental organizations liaising with the IEC also participate in this preparation. IEC collaborates closely with the International Organization for Standardization (ISO) in accordance with conditions determined by agreement between the two organizations.
2) The formal decisions or agreements of IEC on technical matters express, as nearly as possible, an international consensus of opinion on the relevant subjects since each technical committee has representation from all interested IEC National Committees.
3) IEC Publications have the form of recommendations for international use and are accepted by IEC National Committees in that sense. While all reasonable efforts are made to ensure that the technical content of IEC Publications is accurate, IEC cannot be held responsible for the way in which they are used or for any misinterpretation by any end user.
4) In order to promote international uniformity, IEC National Committees undertake to apply IEC Publications transparently to the maximum extent possible in their national and regional publications. Any divergence between any IEC Publication and the corresponding national or regional publication shall be clearly indicated in the latter.
5) IEC itself does not provide any attestation of conformity. Independent certification bodies provide conformity assessment services and, in some areas, access to IEC marks of conformity. IEC is not responsible for any services carried out by independent certification bodies.
6) All users should ensure that they have the latest edition of this publication.
7) No liability shall attach to IEC or its directors, employees, servants or agents including individual experts and members of its technical committees and IEC National Committees for any personal injury, property damage or other damage of any nature whatsoever, whether direct or indirect, or for costs (including legal fees) and expenses arising out of the publication, use of, or reliance upon, this IEC Publication or any other IEC Publications.
8) Attention is drawn to the Normative references cited in this publication. Use of the referenced publications is indispensable for the correct application of this publication.
9) Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. IEC shall not be held responsible for identifying any or all such patent rights.

Amendment 1 to IEC 60700-1:2015 has been prepared by subcommittee 22F: Power electronics for electrical transmission and distribution systems, of IEC technical committee 22: Power electronic systems and equipment.

The text of this amendment is based on the following documents:

Draft	Report on voting
22F/604/CDV	22F/628/RVC

Full information on the voting for its approval can be found in the report on voting indicated in the above table.

The language used for the development of this Amendment is English.

This document was drafted in accordance with ISO/IEC Directives, Part 2, and developed in accordance with ISO/IEC Directives, Part 1 and ISO/IEC Directives, IEC Supplement, available at www.iec.ch/members_experts/refdocs. The main document types developed by IEC are described in greater detail at www.iec.ch/standardsdev/publications/.

The committee has decided that the contents of this document will remain unchanged until the stability date indicated on the IEC website under webstore.iec.ch in the data related to the specific document. At this date, the document will be

- reconfirmed,
- withdrawn,
- replaced by a revised edition, or
- amended.

---

2 Normative references

Replace the existing reference to IEC 61803:1999 and IEC 61803:1999/AMD1:2010, as well as its associated footnote, with:

IEC 61803:2020, *Determination of power losses in high-voltage direct current (HVDC) converter stations with line-commutated converters*

Replace the existing reference to ISO/IEC Guide 25, as well as its associated footnote, with:

ISO/IEC 17025, *General requirements for the competence of testing and calibration laboratories*

3 Terms and definitions

3.1.4
valve protective firing

Delete the existing term and definition.

3.2 Valve construction terms

Delete subclause 3.2 and existing terms and definitions 3.2.1 to 3.2.7, without renumbering subsequent subclauses.

6.3.2 Valve support d.c. voltage test

Replace, in the second sentence of the first paragraph, "50 % of the maximum test voltage" *with* "50 % of 1 min test voltage"*.*

Delete, in the second sentence of the first paragraph, "in approximately 10 s".

6.3.3 Valve support a.c. voltage test

Replace, in the second sentence of the first paragraph, "50 % of the maximum test voltage" *with* "50 % of 1 min test voltage".

Replace, in the second sentence of the first paragraph, "within approximately 10 s" *with* "in approximately 10 s".

7.2 Test object

Replace the existing second paragraph with the following new paragraph:

Individual valves may have to be short-circuited depending on the configuration of the MVU and objectives of the tests. The stresses on the different valves in the MVU depend on whether those valves belong to the same phase or to different phases.

7.3.1 MVU d.c. voltage test to earth

Replace, in the first sentence of the second paragraph, "50 % of the maximum test voltage" *with* "50 % of 1 min test voltage".

Delete in the first sentence of the second paragraph "in approximately 10 s".

7.3.4 MVU lightning impulse test

Replace the existing last paragraph by the following new paragraph:

Subject to agreement between the purchaser and supplier, the MVU lightning impulse test need not be performed, if it can be shown by other means that:

a) the external air clearances to other valves and to earth are adequate for the lightning impulse voltage withstand level required, and

a) the lightning impulse withstand between any two terminals of the MVU is adequately demonstrated by other tests.

8.1 Purpose of tests

Add, at the end of the existing subclause, the following new paragraph:

It should be also noted that the atmospheric correction is not needed in dielectric tests between valve terminals. However, for valves installed at an altitude exceeding 1 000 m the valve internal air clearance shall be verified by additional tests under the atmospheric corrected test voltages. Thyristors and snubber circuits can be replaced by insulating blocks in these tests.