

STN	Určovanie výkonových strát v meničových staniciach s meničmi riadenými sieťou pri prenose energie jednosmerným prúdom vysokého napätia (HVDC)	STN EN IEC 61803 35 1541
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Determination of power losses in high-voltage direct current (HVDC) converter stations with line-commutated converters

Táto norma obsahuje anglickú verziu európskej normy.
This standard includes the English version of the European Standard.

Táto norma bola oznámená vo Vestníku ÚNMS SR č. 03/21

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Supersedes EN 61803:1999 and all of its amendments
and corrigenda (if any)

English Version

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

Détermination des pertes en puissance dans les postes de
conversion en courant continu à haute tension (CCHT)
munis de convertisseurs commutés par la ligne
(IEC 61803:2020)

Bestimmung der Leistungsverluste in
Hochspannungsgleichstrom- (HGÜ-)Stromrichterstationen
mit netzgeführten Stromrichtern
(IEC 61803:2020)

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EN IEC 61803:2020 (E)**European foreword**

The text of document 22F/563/CDV, future edition 2 of IEC 61803, 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 IEC 61803:2020.

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Annex ZA (normative)

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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.

<u>Publication</u>	<u>Year</u>	<u>Title</u>	<u>EN/HD</u>	<u>Year</u>
IEC 60076-1	-	Power transformers - Part 1: General	EN 60076-1	-
IEC 60076-6	-	Power transformers - Part 6: Reactors	EN 60076-6	-
IEC 60633	-	High-voltage direct current (HVDC) transmission - Vocabulary	EN IEC 60633	-
IEC 60700-1	2015	Thyristor valves for high voltage direct current (HVDC) power transmission - Part 1: Electrical testing	EN 60700-1	2015
IEC 60871-1	-	Shunt capacitors for a.c. power systems having a rated voltage above 1 000 V - Part 1: General	EN 60871-1	-

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Edition 2.0 2020-10

INTERNATIONAL STANDARD

NORME INTERNATIONALE

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Détermination des pertes en puissance dans les postes de conversion en courant continu à haute tension (CCHT) munis de convertisseurs commutés par la ligne



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IEC 61803

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INTERNATIONAL STANDARD

NORME INTERNATIONALE

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Détermination des pertes en puissance dans les postes de conversion en courant continu à haute tension (CCHT) munis de convertisseurs commutés par la ligne

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

**DETERMINATION OF POWER LOSSES IN HIGH-VOLTAGE
DIRECT CURRENT (HVDC) CONVERTER STATIONS WITH
LINE-COMMUTATED CONVERTERS**

FOREWORD

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International Standard IEC 61803 has been prepared by subcommittee 22F: Power electronics for electrical transmission and distribution systems, of IEC technical committee 22: Power electronic systems and equipment.

This second edition cancels and replaces the first edition published in 1999, Amendment 1:2010 and Amendment 2:2016. This edition constitutes a technical revision.

This edition includes the following significant technical changes with respect to the previous edition:

- a) to facilitate the application of this document and to ensure its quality remains consistent, 5.1.8 and 5.8 have been reviewed, taking into consideration that the present thyristor production technology provides considerably less thyristor parameters dispersion comparing with the situation in 1999 when the first edition of IEC 61803 was developed, and therefore the production records of thyristors can be used for the power losses calculation;

- b) the calculation of the total station load losses (cases D1 and D2 in Annex C) has been corrected.

The text of this International Standard is based on the following documents:

CDV	Report on voting
22F/563/CDV	22F/580A/RVC

Full information on the voting for the approval of this International Standard can be found in the report on voting indicated in the above table.

This document has been drafted in accordance with the ISO/IEC Directives, Part 2.

The committee has decided that the contents of this document will remain unchanged until the stability date indicated on the IEC website under "<http://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.

DETERMINATION OF POWER LOSSES IN HIGH-VOLTAGE DIRECT CURRENT (HVDC) CONVERTER STATIONS WITH LINE-COMMUTATED CONVERTERS

1 Scope

This document applies to all line-commutated high-voltage direct current (HVDC) converter stations used for power exchange (power transmission or back-to-back installation) in utility systems. This document presumes the use of 12-pulse thyristor converters but can, with due care, also be used for 6-pulse thyristor converters.

In some applications, synchronous compensators or static var compensators (SVC) may be connected to the AC bus of the HVDC converter station. The loss determination procedures for such equipment are not included in this document.

This document presents a set of standard procedures for determining the total losses of an HVDC converter station. The procedures cover all parts, except as noted above, and address no-load operation and operating losses together with their methods of calculation which use, wherever possible, measured parameters.

Converter station designs employing novel components or circuit configurations compared to the typical design assumed in this document, or designs equipped with unusual auxiliary circuits that could affect the losses, are assessed on their own merits.

2 Normative references

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.

IEC 60076-1, *Power transformers – Part 1: General*

IEC 60076-6, *Power transformers – Part 6: Reactors*

IEC 60633, *High-voltage direct current (HVDC) transmission – Vocabulary*

IEC 60700-1:2015, *Thyristor valves for high voltage direct current (HVDC) power transmission – Part 1: Electrical testing*

IEC 60871-1, *Shunt capacitors for a.c. power systems having a rated voltage above 1 000 V – Part 1: General*

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