ICS 29.160.01, 29.160.20 SLOVENSKÁ TECHNICKÁ NORMA Júl 2022

STN	**Točivé elektrické stroje Časť 33: Osobitné technické požiadavky na synchrónne hydrogenerátory vrátane motorgenerátorov**	**STN EN IEC 60034-33** 35 0000

Rotating electrical machines - Part 33: Synchronous hydrogenerators including motor-generators - Specific requirements

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. 06/22

Obsahuje: EN IEC 60034-33:2022, IEC 60034-33:2022

135099

EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN IEC 60034-33

March 2022

ICS 29.160.01; 29.160.20

English Version

Rotating electrical machines - Part 33: Synchronous hydrogenerators including motor-generators - Specific requirements (IEC 60034-33:2022)

Machines électriques tournantes - Partie 33 : Hydro-génératrices synchrones y compris les groupes moteur-générateurs - Exigences spécifiques (IEC 60034-33:2022)

Drehende elektrische Maschinen - Teil 33: Besondere Anforderungen an Synchrongeneratoren, angetrieben durch hydraulische Turbinen, einschließlich Motor-Generatoren (IEC 60034-33:2022)

This European Standard was approved by CENELEC on 2022-03-04. CENELEC members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration.

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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

EN IEC 60034-33:2022 (E)

European foreword

The text of document 2/2081/FDIS, future edition 1 of IEC 60034-33, prepared by IEC/TC 2 "Rotating machinery" was submitted to the IEC-CENELEC parallel vote and approved by CENELEC as EN IEC 60034-33:2022.

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)	2022-12-04
• latest date by which the national standards conflicting with the document have to be withdrawn	(dow)	2025-03-04

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 60034-33:2022 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/TS 60034-32 NOTE Harmonized as CLC IEC/TS 60034-32

ISO 5801 NOTE Harmonized as EN ISO 5801

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.

Publication	Year	Title	EN/HD	Year
IEC 60034-1	-	Rotating electrical machines - Part 1: Rating and performance	EN 60034-1[1]	-
IEC 60034-2-1	-	Rotating electrical machines - Part 2-1: Standard methods for determining losses and efficiency from tests (excluding machines for traction vehicles)	EN 60034-2-1	-
IEC 60034-2-2	-	Rotating electrical machines - Part 2-2: Specific methods for determining separate losses of large machines from tests - Supplement to IEC 60034-2-1	EN 60034-2-2	-
IEC 60034-4-1	-	Rotating electrical machines - Part 4-1: Methods for determining electrically excited synchronous machine quantities from tests	EN IEC 60034-4-1	-
IEC 60034-15	-	Rotating electrical machines - Part 15: Impulse voltage withstand levels of form-wound stator coils for rotating a.c. machines	EN 60034-15	-
IEC 60034-18-1	-	Rotating electrical machines - Part 18-1: Functional evaluation of insulation systems - General guidelines	EN 60034-18-1	-
IEC 60034-18-32	-	Rotating electrical machines - Part 18-32: Functional evaluation of insulation systems - Test procedures for form-wound windings - Evaluation by electrical endurance	EN IEC 60034-18-32	-

[1] Under preparation. Stage at the time of publication: FprEN 60034-1 and FprEN 60034-1/prAA.

EN IEC 60034-33:2022 (E)

IEC/TS 60034-18-33	-	Rotating electrical machines - Part 18-33: Functional evaluation of insulation systems - Test procedures for form-wound windings - Multifactor evaluation by endurance under simultaneous thermal and electrical stresses	CLC/TS 60034-18-33	
IEC 60034-27-1	-	Rotating electrical machines - Part 27-1: Off-line partial discharge measurements on the winding insulation	EN IEC 60034-27-1	-
IEC 60034-27-3	-	Rotating electrical machines - Part 27-3: Dielectric dissipation factor measurement on stator winding insulation of rotating electrical machines	EN 60034-27-3	-
IEC 60034-27-4	-	Rotating electrical machines - Part 27-4: Measurement of insulation resistance and polarization index of winding insulation of rotating electrical machines	EN IEC 60034-27-4	-
IEC 60050-411	-	International Electrotechnical Vocabulary (IEV) - Part 411: Rotating machinery	-	-
IEC 60060-1	-	High-voltage test techniques - Part 1: General definitions and test requirements	EN 60060-1	-
IEC 60085	-	Electrical insulation - Thermal evaluation and designation	EN 60085	-
IEC 60287-3-1	-	Electric cables - Calculation of the current rating - Part 3-1: Operating conditions - Site reference conditions	-	-
IEC 60417	2002	Graphical symbols for use on equipment - 12-month subscription to regularly updated online database comprising all graphical symbols published in IEC 60417	-	-
IEC 60445	-	Basic and safety principles for man-machine interface, marking and identification - Identification of equipment terminals, conductor terminations and conductors	EN IEC 60445	-
IEC 63132-1	-	Guidance for installation procedures and tolerances of hydroelectric machines - Part 1: General aspects	EN IEC 63132-1	-
IEC 63132-2	-	Guidance for installation procedures and tolerances of hydroelectric machines - Part 2: Vertical generators	EN IEC 63132-2	-
ISO 20816-1	-	Mechanical vibration - Measurement and evaluation of machine vibration - Part 1: General guidelines	-	-
ISO 20816-5	-	Mechanical vibration - Measurement and evaluation of machine vibration - Part 5: Machine sets in hydraulic power generating and pump-storage plants	-	-
-	-	Earthing of power installations exceeding 1 kV a.c.	EN 50522	2010

IEEE Std 1043™	1996	IEEE Recommended practice for voltage-endurance testing of form-wound bars and coils	-	-
IEEE Std 1310™	2012	IEEE Recommended practice for thermal cycle for voltage-endurance testing of form-wound bars and coils for large rotating machines	-	-
IEEE Std 1553™	2002	IEEE Trial-use standard for voltage-endurance testing of form-wound coils and bars for hydrogenerators	-	-

IEC 60034-33

Edition 1.0 2022-01

INTERNATIONAL STANDARD

NORME INTERNATIONALE

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Machines électriques tournantes – Partie 33: Hydro-génératrices synchrones y compris les groupes moteur-générateurs – Exigences spécifiques

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

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ROTATING ELECTRICAL MACHINES –

Part 33: Synchronous hydrogenerators including motor-generators – Specific requirements

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.
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IEC 60034-33 has been prepared by IEC technical committee 2: Rotating machinery. It is an International Standard.

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

Draft	Report on voting
2/2081/FDIS	2/2088/RVD

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 International Standard 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.

A list of all parts in the IEC 60034 series, published under the general title *Rotating electrical machines*, can be found on the IEC website.

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.

ROTATING ELECTRICAL MACHINES –

Part 33: Synchronous hydrogenerators including motor-generators – Specific requirements

1 Scope

This part of IEC 60034 applies to three-phase salient-pole synchronous generators and synchronous motor-generators for hydraulic turbine and pump-turbine applications, that have rated frequency of 50 Hz or 60 Hz, rated output of 10 MVA and above, pole pair number 3 and above, and rated voltage of 6 kV and above.

This document supplements basic requirements for rotating machines given in IEC 60034-1.

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 60034-1, *Rotating electrical machines – Part 1: Rating and performance*

IEC 60034-2-1, *Rotating electrical machines – Part 2-1: Standard methods for determining losses and efficiency from tests (excluding machines for traction vehicles)*

IEC 60034-2-2, *Rotating electrical machines – Part 2-2: Specific methods for determining separate losses of large machines from tests – Supplement to IEC 60034-2-1*

IEC 60034-4-1, *Rotating electrical machines – Part 4-1: Methods for determining electrically excited synchronous machine quantities from tests*

IEC 60034-15, *Rotating electrical machines – Part 15: Impulse voltage withstand levels of form-wound stator coils for rotating a.c. machines*

IEC 60034-18-1, *Rotating electrical machines – Part 18-1: Functional evaluation of insulation systems – General guidelines*

IEC 60034-18-32, *Rotating electrical machines – Part 18-32: Functional evaluation of insulation systems – Test procedures for form-wound windings – Evaluation by electrical endurance*

IEC TS 60034-18-33, *Rotating electrical machines – Part 18-33: Functional evaluation of insulation systems – Test procedures for form-wound windings – Multifactor evaluation by endurance under simultaneous thermal and electrical stresses*

IEC 60034-27-1, *Rotating electrical machines – Part 27-1: Off-line partial discharge measurements on the winding insulation*

IEC 60034-27-3, *Rotating electrical machines – Part 27-3: Dielectric dissipation factor measurement on stator winding insulation of rotating electrical machines*

IEC 60034-27-4, *Rotating electrical machines – Part 27-4: Measurement of insulation resistance and polarization index of winding insulation of rotating electrical machines*

IEC 60050-411, *International Electrotechnical Vocabulary (IEV) – Part 411: Rotating machinery*

IEC 60060-1, *High-voltage test techniques – Part 1: General definitions and test requirements*

IEC 60085, *Electrical insulation – Thermal evaluation and designation*

IEC 60287-3-1, *Electric cables – Calculation of the current rating – Part 3-1: Operating conditions – Site reference conditions*

IEC 60417:2002, *Graphical symbols for use on equipment – 12-month subscription to regularly updated online database comprising all graphical symbols published in IEC 60417*

IEC 60445, *Basic and safety principles for man-machine interface, marking and identification – Identification of equipment terminals, conductor terminations and conductors*

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IEEE Std 1310™:2012, *IEEE Recommended practice for thermal cycle for voltage-endurance testing of form-wound bars and coils for large rotating machines*

IEEE Std 1553™:2002, *IEEE Trial-use standard for voltage-endurance testing of form-wound coils and bars for hydrogenerators*