

INTERNATIONAL STANDARD

NORME INTERNATIONALE

**Rotating electrical machines –
Part 3: Specific requirements for synchronous generators driven by steam
turbines or combustion gas turbines and for synchronous compensators**

**Machines électriques tournantes –
Partie 3: Exigences spécifiques pour les alternateurs synchrones entraînés
par des turbines à vapeur ou par des turbines à gaz et pour les compensateurs
synchrones**



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CONTENTS

FOREWORD	5
1 Scope	7
2 Normative references	7
3 Terms and definitions	8
4 General	8
4.1 General rules	8
4.2 Rated conditions	9
4.2.1 Generators	9
4.2.2 Compensators	9
4.3 Rated voltage	9
4.4 Power factor	9
4.5 Rated speed	10
4.6 Ranges of voltage and frequency	10
4.7 Direction of rotation	11
4.8 Stator winding, output voltage	11
4.9 Winding insulation	11
4.9.1 Insulation systems, thermal class	11
4.9.2 Withstand voltage tests	11
4.10 Insulation against shaft current	12
4.11 Overspeed test	12
4.12 Critical speeds	12
4.13 P - Q capability diagram	12
4.14 Overcurrent requirements	14
4.14.1 General	14
4.14.2 Stator current	14
4.14.3 Rotor field current	14
4.15 Unbalanced currents and current harmonics capability	15
4.15.1 Negative sequence current	15
4.15.2 Current harmonics	15
4.16 Sudden short circuit	16
4.17 Synchronisation	16
4.18 Short circuit ratio (SCR)	17
4.19 Direct axis transient and subtransient reactances	17
4.20 Tolerances on short circuit ratio and direct axis transient and subtransient reactances	17
4.21 Mechanical conditions for rotors	17
4.21.1 Number of starts	17
4.21.2 Turning gear operation	18
4.22 Coolers	18
5 Air-cooled generators or compensators	18
5.1 General	18
5.2 Cooling system	18
5.3 Temperature of primary coolant	19
5.3.1 General	19
5.3.2 Temperature detectors	19
6 Hydrogen-cooled or liquid-cooled generators or compensators	19

6.1	General.....	19
6.2	Hydrogen pressure and purity in the casing	19
6.3	Machine housing and cover plates	20
6.4	Stator winding terminals.....	20
6.5	Temperature of primary coolants, temperatures and temperature rises	20
6.6	Temperature detectors.....	20
6.7	Auxiliary systems	21
7	Generators for combustion gas turbines or combined cycle applications	21
7.1	General.....	21
7.2	Service conditions.....	21
7.2.1	General	21
7.2.2	Primary coolant temperature.....	22
7.2.3	Number of starts.....	22
7.2.4	Application of load	22
7.3	Rated output	22
7.4	Capabilities	22
7.4.1	General	22
7.4.2	Base capability	22
7.4.3	Temperature rise and temperatures at base capability	24
7.4.4	Peak capability	24
7.5	Rating plate	25
7.6	Temperature tests.....	25
	Annex A (normative) Precautions to be taken when using hydrogen- cooled synchronous generators or compensators	26
A.1	General.....	26
A.2	Hydrogen purity	26
A.3	Normal operating conditions.....	26
A.4	Protective measures for sliprings and coupled exciters	26
A.5	Auxiliary equipment	27
A.5.1	General	27
A.5.2	Degassing tanks	27
A.5.3	Gas dryer	27
A.5.4	Instrumentation, control devices	27
A.5.5	Electrical connections	27
A.5.6	Containment of hydrogen.....	28
A.5.7	Accumulation of hydrogen-air mixture	29
A.5.8	Vent pipes	29
A.5.9	Adjacent area	29
A.6	Operation of the generator and its auxiliary equipment.....	29
A.6.1	Sources of ignition.....	29
A.6.2	Hydrogen-air mixture	29
A.6.3	Air or hydrogen displacement	29
A.6.4	Seal oil supply and hydrogen pressure	30
A.6.5	Gas tightness	30
A.6.6	Water system	31
A.7	Guidance for adequate ventilation.....	31
	Bibliography.....	33
	Figure 1 – Operation over ranges of voltage and frequency	10

Figure 2 – Typical P - Q capability diagram of a generator	13
Figure 3 – Typical generator capability curves	23
Figure A.1 – Example of a large hydrogen supply unit feeding one or more generators (simplified diagram)	32

INTERNATIONAL ELECTROTECHNICAL COMMISSION

ROTATING ELECTRICAL MACHINES –

**Part 3: Specific requirements for synchronous generators
driven by steam turbines or combustion gas turbines
and for synchronous compensators**

FOREWORD

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International Standard IEC 60034-3 has been prepared by IEC technical committee 2: Rotating machinery.

This seventh edition cancels and replaces the sixth edition published in 2007. This edition constitutes a technical revision.

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

- a) title modified;
- b) scope extended to synchronous compensators;
- c) rotor overcurrent requirements added;
- d) impact of stator harmonics on rotor unbalanced load capability introduced;
- e) synchronisation requirements added;

- f) adjustments of temperatures or temperature rise revised for gas turbine applications;
- g) requirements for auxiliaries updated.

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

FDIS	Report on voting
2/1987/FDIS	2/1993/RVD

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.

A list of all parts of 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 "<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.

ROTATING ELECTRICAL MACHINES –

Part 3: Specific requirements for synchronous generators driven by steam turbines or combustion gas turbines and for synchronous compensators

1 Scope

This part of IEC 60034 applies to large three-phase synchronous generators, having rated outputs of 10 MVA and above driven by steam turbines or combustion gas turbines. Also included are synchronous Mvar compensators of the same output range connected to a grid for the purpose of exchanging reactive power.

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

Common requirements are specified together with specific requirements for air, hydrogen or liquid cooled synchronous generators or compensators.

This document also gives the precautions to be taken when using hydrogen cooled generators including:

- rotating exciters driven by synchronous generators;
- auxiliary equipment needed for operating the generators;
- parts of the building where hydrogen might accumulate.

These requirements also apply to a synchronous generator driven by both a steam turbine and a combustion gas turbine as part of a single shaft combined cycle unit.

These requirements do not apply to synchronous generators driven by water (hydraulic) turbines or wind turbines.

NOTE The precautions taken when using hydrogen are valid for all cases where hydrogen is used as a coolant.

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 60034-1:2017, *Rotating electrical machines – Part 1: Rating and performance*

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

IEC 60045-1, *Steam turbines – Part 1: Specifications*

IEC 60079 (all parts), *Explosive atmospheres*

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