



International Standard

ISO 8528-5

Reciprocating internal combustion engine driven alternating current generating sets —

Part 5: Generating sets

*Groupes électrogènes à courant alternatif entraînés par moteurs
alternatifs à combustion interne —*

Partie 5: Groupes électrogènes

**Sixth edition
2025-05**

iTeh Standards
(<https://standards.iteh.ai>)
Document Preview

ISO 8528-5:2025

<https://standards.iteh.ai/catalog/standards/iso/edfb148c-73fc-4324-9287-cf1095961774/iso-8528-5-2025>

iTeh Standards
(<https://standards.itih.ai>)
Document Preview

ISO 8528-5:2025

<https://standards.itih.ai/catalog/standards/iso/edfb148c-73fc-4324-9287-cf1095961774/iso-8528-5-2025>



COPYRIGHT PROTECTED DOCUMENT

© ISO 2025

All rights reserved. Unless otherwise specified, or required in the context of its implementation, no part of this publication may be reproduced or utilized otherwise in any form or by any means, electronic or mechanical, including photocopying, or posting on the internet or an intranet, without prior written permission. Permission can be requested from either ISO at the address below or ISO's member body in the country of the requester.

ISO copyright office
CP 401 • Ch. de Blandonnet 8
CH-1214 Vernier, Geneva
Phone: +41 22 749 01 11
Email: copyright@iso.org
Website: www.iso.org

Published in Switzerland

Contents

Page

Foreword	iv
1 Scope	1
2 Normative references	1
3 Terms, definitions and symbols	1
3.1 Terms and definitions	1
3.2 Symbols	10
4 Other regulations and additional requirements	14
5 Frequency characteristics	14
5.1 General	14
5.2 Safety frequency	15
6 Voltage characteristics	15
7 Sustained short-circuit current	15
8 Factors affecting generating set performance	16
8.1 General	16
8.2 Power	16
8.3 Frequency and voltage	16
8.4 Load acceptance	16
9 Cyclic irregularity	19
10 Starting characteristics	21
11 Stop time characteristics	23
12 Parallel operation	23
12.1 Generating sets coupled with each other without grid	23
12.1.1 Active power sharing	24
12.1.2 Reactive power sharing	26
12.2 Generating sets connected to the grid in a paralleling application	27
12.2.1 General	27
12.2.2 Influence on operating behaviour	28
12.2.3 Design features required for paralleling to a public grid network	28
13 Rating plates	35
14 Additional factors influencing generating set performance	36
14.1 Starting methods	36
14.2 Shutdown methods	36
14.3 Fuel and lubrication oil supply	36
14.4 Combustion air	36
14.5 Exhaust system	36
14.6 Cooling and room ventilation	37
14.7 Monitoring	37
14.8 Noise emission	37
14.9 Coupling	38
14.10 Vibration	38
14.10.1 General	38
14.10.2 Torsional vibration	38
14.10.3 Linear vibration	38
14.11 Foundations	39
15 Performance class operating limit values	39
15.1 General	39
15.2 Recommendation for gas engine operating limit values	39
Bibliography	42

Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular, the different approval criteria needed for the different types of ISO document should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

ISO draws attention to the possibility that the implementation of this document may involve the use of (a) patent(s). ISO takes no position concerning the evidence, validity or applicability of any claimed patent rights in respect thereof. As of the date of publication of this document, ISO had not received notice of (a) patent(s) which may be required to implement this document. However, implementers are cautioned that this may not represent the latest information, which may be obtained from the patent database available at www.iso.org/patents. ISO shall not be held responsible for identifying any or all such patent rights.

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation of the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT), see www.iso.org/iso/foreword.html.

This document was prepared by Technical Committee ISO/TC 70, *Internal combustion engines*.

This sixth edition cancels and replaces the fifth edition (ISO 8528-5:2022), which has been technically revised.

The main changes are as follows:

- [Clause 3](#) has been updated;
- [Subclause 12.2](#) has been re-written;
- list of symbols has been added in [3.2](#);
- errors have been corrected in [Table 4](#);
- Figure 4 has been added;
- previous Figures 3, 4, 5, 6, 7, 8, 9, 10 and 11 have been renumbered and modified
- previous figure 12 has been deleted;
- Figures 13, 14 and 15 have been modified;
- previous Figure 17 has been deleted;
- new Figures 16, 17 and 18 have been added.

A list of all parts in the ISO 8528 series can be found on the ISO website.

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

Reciprocating internal combustion engine driven alternating current generating sets —

Part 5: Generating sets

1 Scope

This document specifies design and performance criteria arising out of the combination of a reciprocating internal combustion (RIC) engine and an alternating current (AC) generator when operating as a unit. This unit can run in parallel to the grid or not.

This document applies to AC generating sets driven by RIC engines for land and marine use, excluding generating sets used on aircraft, or to propel land vehicles and locomotives.

For some specific applications (e.g. essential hospital supplies and high-rise buildings), supplementary requirements can apply. The provisions of this document are a basis for establishing any supplementary requirements.

For generating sets driven by other reciprocating-type prime movers (e.g. steam engines), the provisions of this document can be used as a basis for establishing these requirements.

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.

<https://standards.iteh.ai/catalog/standards/iso/edfb148c-73fc-4324-9287-cf1095961774/iso-8528-5-2025>
ISO 3046-5, *Reciprocating internal combustion engines — Performance — Part 5: Torsional vibrations*

ISO 8528-1:2018, *Reciprocating internal combustion engine driven alternating current generating sets — Part 1: Application, ratings and performance*

ISO 8528-3:2020, *Reciprocating internal combustion engine driven alternating current generating sets — Part 3: Alternating current generators for generating sets*

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

3 Terms, definitions and symbols

3.1 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

ISO and IEC maintain terminology databases for use in standardization at the following addresses:

- ISO Online browsing platform: available at <https://www.iso.org/obp>
- IEC Electropedia: available at <https://www.electropedia.org/>

3.1.1 frequency

f
reciprocal of the period

Note 1 to entry: The symbol f is mainly used when the period is a time.

3.1.2 no-load frequency

f_i
frequency at which the generating set is operating without load

3.1.3 rated no-load frequency

$f_{i,r}$
frequency at which the generating set is designed to operate without load

3.1.4 rated frequency

f_r
frequency at which the generating set is designed to operate at rated load

3.1.5 maximum safety frequency

f_{\max}
maximum frequency which causes a stop to production

3.1.6 minimum safety frequency

f_{\min}
minimum frequency which causes a stop to production

3.1.7 frequency setting rate of change

v_f
rate of change of frequency setting under remote control

<https://standards.iteh.ai/catalog/standards/iso/edfb148c-73fc-4324-9287-cf1095961774/iso-8528-5-2025>

Note 1 to entry: $v_f = \frac{(f_{i,\max} - f_{i,\min}) / f_r}{t} \times 100$

where

$f_{i,\max}$ is the maximum no-load frequency;

$f_{i,\min}$ is the minimum no-load frequency;

f_r is the *rated frequency* (3.1.4).

Note 2 to entry: Expressed as a percentage of related range of frequency setting per second.

3.1.8 voltage setting rate of change

v_U
rate of change of voltage setting under remote control

Note 1 to entry: $v_U = \frac{(U_{s,\text{up}} - U_{s,\text{do}}) / U_r}{t} \times 100$

where