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Reciprocating internal combustion engine driven alternating current generating sets —

Part 10: Measurement of airborne noise

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

Partie 10: Mesurage du bruit aérien

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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 documents 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).

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see www.iso.org/patents).

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*, in collaboration with the European Committee for Standardization (CEN) Technical Committee CEN/TC 270, *Internal combustion engines*, in accordance with the Agreement on technical cooperation between ISO and CEN (Vienna Agreement).

This second edition cancels and replaces the first edition (ISO 8528-10:1998), which has been technically revised.

The main changes are as follows:

— the normative references have been updated;

— the latest requirements of ISO 3744:2010 and ISO 3746:2010 have been included, respecting ISO 12001:1996 requirements;

— the measurement surfaces have been updated;

— the definition of the reference box in special cases has been added;

— the guaranteed sound power level has been added;

— requirements concerning variable speed engine gensets, fans and lighting towers have been added;

— the requirements for welding generators have been updated;

— the determination of the emission sound pressure level at workstation has been updated.

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.

Introduction

This document specifies noise test codes for determining the basic noise emission descriptors.

For many manufacturers of generating sets, the control of noise is a major issue that requires effective exchange of acoustical information, in particular on noise emission. The basic noise emission descriptors are the sound power level of the generating set itself and the emission sound pressure level at the workstation.

In this context, the main flow of information goes from the manufacturer to the purchaser. However, installers and users of the generating sets also desire comprehensive information about the generating sets' ability to generate airborne sound.

Thus, measuring the basic noise emission descriptors allows the generating set manufacturer to determine, declare and verify the noise emission values.

Therefore, the sound power level, as the major parameter to characterize machines as sound sources, is determined by measurements. The sound power level is a major parameter because it represents an intrinsic characteristic of generating sets as noise sources. It is useful, for example, in noise-abatement programmes or when designing a building where the generating set is intended to be used.

The emission sound pressure level at the workstation is also measured. This enables an assessment of the risk of exposure to the airborne sound of the operators. This assessment is essential for health and safety reasons.

In this document, the generating sets are considered as steady noise sources as per ISO 12001:1996. The generating sets concerned and the extent to which noise is covered are indicated in this document. This document allows measurements to be made in many different test environments. Clause 5 can be used as a general guideline to assist in the selection of the right noise test code. The selection mainly depends on the test environment and the desired grade of accuracy.

This document contains two methodologies for determining the measurement uncertainty. In Clause 12, the uncertainty U is determined by considering measurements on a single generating set. In Clause 13, the uncertainty K is determined by considering a batch of generating sets, which can be useful for control of production purpose.

This document is a C-type standard as stated in ISO 12001:1996. When provisions of this C-type standard are different from those stated in A or B standards, the provisions of this C-type standard take precedence.

Reciprocating internal combustion engine driven alternating current generating sets —

Part 10: Measurement of airborne noise

1 Scope

This document specifies noise test codes for determining the sound power level and the emission sound pressure level at the workstation of reciprocating internal combustion engine driven electrical power generating sets.

This document applies to constant and variable-speed reciprocating internal combustion (RIC) engine driven alternating current (AC) and direct current (DC) generating sets for fixed and mobile applications with rigid or flexible mountings. It is applicable for land and marine use, excluding generating sets used on aircraft or to propel land vehicles and locomotives.

NOTE 1 For some specific applications (e.g. essential hospital supplies, high-rise buildings) supplementary requirements can be necessary. The provisions of this document can be regarded as a basis.

NOTE 2 This document is referenced with regard to noise in ISO 8528-13:2016, which contains requirements concerning the design of generating sets, verification of noise levels and information related to noise in the operating and maintenance instructions.

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.

ISO 3046-1:2002, *Reciprocating internal combustion engines — Performance — Part 1: Declarations of power, fuel and lubricating oil consumptions, and test methods — Additional requirements for engines for general use*

ISO 3744:2010, *Acoustics — Determination of sound power levels and sound energy levels of noise sources using sound pressure — Engineering methods for an essentially free field over a reflecting plane*

ISO 3746:2010, *Acoustics — Determination of sound power levels and sound energy levels of noise sources using sound pressure — Survey method using an enveloping measurement surface over a reflecting plane*

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

ISO 8528-2:2018, *Reciprocating internal combustion engine driven alternating current generating sets — Part 2: Engines*

ISO 15619:2013, *Reciprocating internal combustion engines — Measurement method for exhaust silencers — Sound power level of exhaust noise and insertion loss using sound pressure and power loss ratio*

IEC 60942:2017, *Electroacoustics - Sound calibrators*

IEC 60974-1:2021, *Arc welding equipment - Part 1: Welding power sources*

IEC 61260-1:2014, *Electroacoustics - Octave-band and fractional-octave-band filters - Part 1: Specifications*