First edition
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Medical electrical equipment —

Part 2-84:
Particular requirements for the basic safety and essential performance of ventilators for the emergency medical services environment

Appareils électromédicaux —

Partie 2-84: Exigences particulières relatives à la sécurité de base et aux performances essentielles des ventilateurs utilisés dans l'environnement des services médicaux d'urgence

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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 jointly by Technical Committee ISO/TC 121, *Anaesthetic and respiratory equipment*, Subcommittee SC 3, *Respiratory devices and related equipment used for patient care,* and Technical Committee IEC/TC 62, *Electrical equipment in medical practice*, Subcommittee 62D, *Electromedical equipment*.

This first edition cancels and replaces ISO 10651-3:1997, which has been technically revised. The main changes compared to the previous edition are as follows:

— extension of the scope to include the *EMS ventilator* and its *accessories*, where the characteristics of those *accessories* can affect the *basic safety* or *essential performance* of the *ventilator for the emergency medical services environment*, and thus not only the *ventilator for the emergency medical services environment* itself;

— identification of *essential performance* for *ventilator for the emergency medical services environment* and its *accessories*;

— modification of the tests for environmental conditions (via IEC 60601-1-12);

— modification of the tests for *alarm conditions* (via IEC 60601-1-8);

— modification of the tests for electromagnetic disturbances (via IEC 60601-1-2);

— addition of the following:

  — tests for ventilation performance;

  — test for instability from unwanted lateral movement;

- test for audible acoustic energy;
- tests for mechanical strength (via IEC 60601-1-12);
- tests for environmental conditions (via IEC 60601-1-12);
- tests for *alarm conditions* (via IEC 60601-1-8);
- tests for electromagnetic disturbances (via IEC 60601-1-2);
- inclusion of the *usability engineering process* (via IEC 60601-1-6);
- new symbols;
- requirements for *ventilator for the emergency medical services environment* as a component of an *ME system*;
- tests for *enclosure* integrity (water ingress via IEC 60601-1-12);
- tests for *cleaning* and *disinfection*;
- determination of probability of component failure during the *expected service life*;
- delivered gas maximum enthalpy requirement;
- performance test and disclosure requirements for other *inflation-types*;
- enhanced inspired oxygen *monitoring equipment* requirements;
- consideration of input gas of Oxygen 93 %;
- use of the vocabulary and semantics of ISO 19223:2019;
- consideration of contamination of the breathing gas delivered to the *patient* from the *gas pathways*.

A list of all parts in the ISO 80601 series and the IEC 80601 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 is a major update of the requirements for a *ventilator for the emergency medical services environment*. It includes harmonizing the requirements from ISO 10651-3, which it replaces, with the third edition of IEC 60601-1 including its first amendment, the fourth edition of IEC 60601-1-2, the second edition of IEC 60601-1-6 including its first amendment, the third edition of IEC 60601-1-8 including its first amendment and the first edition of IEC 60601-1-12.

In this document, the following print types are used:

— Requirements and definitions: roman type;

— *Instructions, test specifications and terms defined in clause 3 of the general standard, in this particular document or as noted: italic type*;

— Informative material appearing outside of tables, such as notes, examples and references: in smaller type. Normative text of tables is also in a smaller type.

In referring to the structure of this document, the term

— “clause” means one of the five numbered divisions within the table of contents, inclusive of all subdivisions (e.g. Clause 201 includes subclauses 201.7, 201.8, etc.);

— “subclause” means a numbered subdivision of a clause (e.g. 201.7, 201.8 and 201.9 are all subclauses of Clause 201).

References to clauses within this document are preceded by the term “Clause” followed by the clause number. References to subclauses within this particular document are by number only.

In this document, the conjunctive “or” is used as an “inclusive or” so a statement is true if any combination of the conditions is true.

For the purposes of this document, the auxiliary verb:

— “shall” means that conformance with a requirement or a test is mandatory for conformance with this document;

— “should” means that conformance with a requirement or a test is recommended but is not mandatory for conformance with this document;

— “may” is used to describe permission (e.g. a permissible way to achieve conformance with a requirement or test);

— "can" is used to describe a possibility or capability; and

— "must" is used to express an external constraint.

Annex C contains a guide to the marking and labelling requirements in this document.

Annex D contains a summary of the symbols referenced in this document.

An asterisk (*) as the first character of a title or at the beginning of a paragraph or table title indicates that there is guidance or rationale related to that item in Annex AA.