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Lung ventilators and related equipment — Vocabulary and semantics —

Part 2: High frequency and jet ventilation

Ventilateurs pulmonaires et équipement associé — Vocabulaire et sémantique —

Partie 2: Ventilation haute fréquence et à jet

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Foreword

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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).

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This document was prepared by Technical Committee ISO/TC 121, *Anaesthetic and respiratory equipment*, Subcommittee SC 4, *Vocabulary and semantics*.

A list of all parts in the ISO 19223 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.

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Introduction

The characteristics of *ventilation-modes* of current automatic *lung ventilators* are often not well understood. The current terminology used for their description is based on that introduced in the early days of *mechanical ventilation,* but with the advances in *ventilator*s, and *ventilation-modes* that have evolved over recent years, the language used has been continuously adapted. In the absence of any effective international coordinating action, this has inevitably led to increasing inconsistencies in the way in which well-established terms and their derivatives are used.

To further compound the difficulties in understanding these complexities, some *ventilator manufacturers* have created new proprietary terms to describe these alternative ways of *ventilating patients*, and others have used existing terms with different meanings in different situations. This has led to *patient* safety hazards, an example being that *lung ventilator* clinical orders (*settings*) for one model of *ventilator* can be quite different from those required to get the same result from a different *ventilator*.

Recognizing these difficulties, the terminology and semantics for *patient ventilation* have been reviewed to compile a standardized vocabulary that is applicable to current and, as far as possible, future practice. The primary objective was to use as terms language already in use in the field of lung ventilation where possible, while clarifying the meaning of each term and limiting its potential for misuse by defining it more precisely. New terms were only introduced where there was no alternative, either in order to name new concepts or where the misuse of existing vocabulary has become so widespread that the term has become meaningless or unacceptably ambiguous. Importance was placed on a vocabulary that would communicate a clear mental model of how the selected *settings* would determine the interaction between the *patient* and the *ventilator*.

In order to achieve a vocabulary that is coherent, consistent and applicable to a range of fields such as *patient* care, research, data collection and incident reporting, this document has been developed with the participation, cooperation and assistance of members of other standards development organizations, and of major international *ventilatormanufacturers.* The applications include *lung ventilators*, medical data systems facilitating clinical care and research, interoperability, incident reporting and equipment maintenance.

It was recognized that much of the current terminology has its origins in the early use of *automatic ventilation*, when the emphasis was inevitably on how best to save the lives of *patients* who are not able to *breathe* for themselves and, consequently, only made basic provisions for the *patient's* own *respiratory activity*. Since that time, *ventilators* have become increasingly interactive with the *patient*, such that it is now necessary to consider their use from a *ventilator-patient* system perspective because it is no longer possible, with any certainty, to predict ahead of time how that interaction will take place.

The terminology in this document is defined and used in a way that makes it capable of facilitating, unambiguously, both the *setting* of a *ventilator* and how to describe and record the resultant *ventilator-patient* interactions, continuously and at defined points within the course of *ventilation*.

The ISO 19223 series does not specify terms specific to physiologic closed-loop *ventilation* or *negative-pressure ventilation*; nor to respiratory support using liquid *ventilation* or extra-corporeal gas exchange, or oxygen, except where it has been considered necessary to establish boundaries between bordering concepts.

In general, the ISO 19223 series is intended to provide a consensus view and the basis for a coherent language for describing *ventilator* function. Now that the fundamental concepts of *artificial ventilation* practice within the scope of this document have matured, it has been possible to review the boundaries between the various concepts of established *ventilation-modes* and the methods of artificially inflating a *patient's lungs* and to formulate definitions that clarify the common elements and the distinctions. In particular, the scopes of several concepts that were appropriate to earlier technology and practice have become inadequate to encompass new developments and it was found necessary to subdivide them. Some of their designating terms have, therefore, had to be deprecated, replaced, or constrained using more restrictive definitions, resulting in an inevitable reintroduction of some little-used legacy terms and the need to create a few new terms.

The overall objective is to encourage a more disciplined use of *ventilator* vocabulary so that *users* trained in the application of this document will be able to move easily from one *ventilator* to another and operate each one, with confidence, after a minimum amount of training. Although it is recognized that change will not be immediate, it is expected that this discipline will feed through into scientific publications, textbooks and

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Lung ventilators and related equipment — Vocabulary and semantics —

Part 2: High frequency and jet ventilation

1 Scope

This document defines terms for:

— *high-frequency oscillatory ventilation* (HFOV);

— *percussive ventilation*, including *high-frequency percussive ventilation* (HFPV);

— *jet ventilation*, including *high frequency jet ventilation* (HFJV);

— modes that combine high-frequency and physiological-rate ventilation.

It is applicable:

— in *lung ventilator* and *breathing*-therapy device standards,

— in health informatics standards,

— for labelling on *medical electrical equipment* and *medical electrical systems,*

— in *medical electrical equipment* and *medical electrical system* instructions for use and *accompanying documents,*

— for *medical electrical equipment* and *medical electrical systems* interoperability, and

— in electronic health records.

This document is also applicable to those accessories intended by their *manufacturer* to be connected to a *ventilatorbreathing system* or to a *ventilator*, where the characteristics of those accessories can affect the basic safety or essential performance of the *ventilator* or *ventilator breathing system*.

NOTE This document can also be used for other applications relating to *lung ventilation*, including non-electrical devices and equipment, research, description of critical events, forensic analysis and adverse event (vigilance) reporting systems.

2 Normative references

There are no normative references in this document.

3 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/

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