

Pressure regulators for use with medical gases —

Part 3: Pressure regulators integrated with cylinder valves

ICS 11.040.10

National foreword

This British Standard is the UK implementation of EN ISO 10524-3:2006+A1:2013. It is identical to ISO 10524-3:2005, incorporating amendment 1:2013. It supersedes BS EN ISO 10524-3:2006, which is withdrawn.

The UK participation in its preparation was entrusted by Technical Committee CH/121, Anaesthetic and respiratory equipment, to Subcommittee CH/121/6, Medical gas supply systems.

A list of organizations represented on this subcommittee can be obtained on request to its secretary.

The publication does not purport to include all the necessary provisions of a contract. Users are responsible for its correct application.

Compliance with a British Standard cannot confer immunity from legal obligations.

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English Version

Pressure regulators for use with medical gases - Part 3:
Pressure regulators integrated with cylinder valves (ISO 10524-
3:2005)

Détendeurs pour l'utilisation avec les gaz médicaux - Partie
3: Détendeurs intégrés dans les robinets des bouteilles de
gaz (ISO 10524-3:2005)

Druckminderer zur Verwendung mit medizinischen Gasen -
Teil 3: Druckminderer in Flaschenventilen (ISO 10524-
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This European Standard was approved by CEN on 20 March 2006.

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Foreword

The text of ISO 10524-3:2005 has been prepared by Technical Committee ISO/TC 121 "Anaesthetic and respiratory equipment" of the International Organization for Standardization (ISO) and has been taken over as EN ISO 10524-3:2006 by Technical Committee CEN/TC 215 "Respiratory and anaesthetic equipment", the secretariat of which is held by BSI.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by October 2006, and conflicting national standards shall be withdrawn at the latest by October 2006.

This document supersedes EN 738-3:1998.

This document has been prepared under a mandate given to CEN by the European Commission and the European Free Trade Association, and supports essential requirements of EU Directive(s).

For relationship with EU Directive(s), see informative Annex ZA, which is an integral part of this document.

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Endorsement notice

The text of ISO 10524-3:2005 has been approved by CEN as EN ISO 10524-3:2006 without any modifications.

Foreword to amendment A1

This document (EN ISO 10524-3:2006/A1:2013) has been prepared by Technical Committee ISO/TC 121 "Anaesthetic and respiratory equipment" in collaboration with Technical Committee CEN/TC 215 "Respiratory and anaesthetic equipment" the secretariat of which is held by BSI.

This Amendment to the European Standard EN ISO 10524:2006 shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by September 2013, and conflicting national standards shall be withdrawn at the latest by March 2016.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN [and/or CENELEC] shall not be held responsible for identifying any or all such patent rights.

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Endorsement notice

The text of ISO 10524-3: 2005/Amd 1:2013 has been approved by CEN as EN ISO 10524-3:2006/A1:2013 without any modification.

Annex ZA (informative)

Relationship between this European Standard and the Essential Requirements of EU Directive 93/42/EEC

This European Standard has been prepared under a mandate given to CEN by the European Commission and the European Free Trade Association to provide one means of conforming to Essential Requirements of the New Approach Directive 93/42/EEC, Medical devices.

Once this standard is cited in the Official Journal of the European Union under that Directive and has been implemented as a national standard in at least one Member State, compliance with the normative clauses of this standard confers, within the limits of the scope of this standard, a presumption of conformity with the relevant Essential Requirements of that Directive and associated EFTA regulations.

WARNING: Other requirements and other EU Directives may be applicable to the products falling within the scope of this standard.

INTERNATIONAL STANDARD

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Pressure regulators for use with medical gases —

Part 3: Pressure regulators integrated with cylinder valves

Détendeurs pour l'utilisation avec les gaz médicaux —

Partie 3: Détendeurs intégrés aux valves des bouteilles de gaz



Reference number
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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.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

The main task of technical committees is to prepare International Standards. Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

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.

ISO 10524-3 was prepared by Technical Committee ISO/TC 121, *Anaesthetic and respiratory equipment*, Subcommittee SC 6, *Medical gas systems*.

ISO 10524 consists of the following parts, under the general title *Pressure regulators for use with medical gases*:

- *Part 1: Pressure regulators and pressure regulators with flow-metering devices*
- *Part 2: Manifold and line pressure regulators*
- *Part 3: Pressure regulators integrated with cylinder valves*
- *Part 4: Low-pressure regulators*

Introduction

Pressure regulators integrated with cylinder valves are used to reduce high cylinder pressure to a lower pressure suitable for use with medical equipment or for delivery of gas directly to a patient.

These functions cover a wide range of inlet and outlet pressures and flows which require specific design characteristics. It is important that the operating characteristics of pressure regulators integrated with cylinder valves be specified and tested in a defined manner.

A pressure regulator normally has coupled to it a device which controls the flow, such as a flow control valve or a fixed orifice. The flow can be indicated by a flowmeter or by a flowgauge.

It is essential that regular inspection and maintenance be undertaken to ensure that the pressure regulators continue to meet the requirements of this part of ISO 10524.

This part of ISO 10524 pays particular attention to:

- use of suitable materials;
- safety (mechanical strength, leakage, safe relief of excess pressure and resistance to ignition);
- gas specificity;
- cleanliness;
- type testing;
- marking;
- information supplied by the manufacturer.

Annex B contains rationale statements for some of the requirements of this part of ISO 10524. The clauses and subclauses marked with an asterisk (*) after their number have corresponding rationale included to provide additional insight into the reasoning that led to the requirements and recommendations that have been incorporated into this part of ISO 10524. It is considered that knowledge of the reasons for the requirements will not only facilitate the proper application of this part of ISO 10524, but will expedite any subsequent revisions.

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Pressure regulators for use with medical gases —

Part 3: Pressure regulators integrated with cylinder valves

1 Scope

1.1 This part of ISO 10524 applies to pressure regulators integrated with cylinder valves (as defined in 3.16) intended for the administration of medical gases in the treatment, management, diagnostic evaluation and care of patients for use with the following medical gases:

- oxygen;
- nitrous oxide;
- air for breathing;
- helium;
- carbon dioxide;
- xenon;
- specified mixtures of the gases listed above;
- air for driving surgical tools;
- nitrogen for driving surgical tools.

1.2 * These pressure regulators integrated with cylinder valves are intended to be fitted to cylinders with nominal filling pressures up to 25 000 kPa at 15 °C and can be provided with devices that control and measure the flow of the medical gas delivered.

2 Normative references

The following referenced documents are indispensable for the application 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 32:1977, *Gas cylinders for medical use — Marking for identification of content*

ISO 407:2004, *Small medical gas cylinders — Pin-index yoke-type valve connections*

ISO 5145, *Cylinder valve outlets for gases and gas mixtures — Selection and dimensioning*

ISO 5359:2000, *Low-pressure hose assemblies for use with medical gases*

ISO 7396-1:2002, *Medical gas pipeline systems — Part 1: Pipelines for compressed medical gases and vacuum*

ISO/TR 7470:1988, *Valve outlets for gas cylinders — List of provisions which are either standardized or in use*

ISO 9170-1:1999, *Terminal units for medical gas pipeline systems — Part 1: Terminal units for use with compressed medical gases and vacuum*

ISO 10297:—¹⁾, *Transportable gas cylinders — Cylinder valves — Specification and type testing*

ISO 10920:1997, *Gas cylinders — 25E taper thread for connection of valves to gas cylinders — Specification*

EN ISO 11116-1:1999, *Gas cylinders — 17E taper thread for connection of valves to gas cylinders — Part 1: Specifications*

ISO 11117:1998, *Gas cylinders — Valve protection caps and valve guards for industrial and medical gas cylinders — Design, construction and tests*

ISO 13341:1997, *Transportable gas cylinders — Fitting of valves to gas cylinders*

ISO 14971:2000, *Medical devices — Application of risk management to medical devices*

ISO 15001:2003, *Anaesthetic and respiratory equipment — Compatibility with oxygen*

ISO 15245-1:2001, *Gas cylinders — Parallel threads for connection of valves to gas cylinders — Part 1: Specification*

EN 837-1:1996, *Pressure gauges — Part 1: Bourdon tube pressure gauges — Dimensions, metrology, requirements and testing*

EN 13544-2:2002, *Respiratory therapy equipment — Part 2: Tubing and connectors*

IEC 60601-1:1988, *Medical electrical equipment — Part 1: General requirements for safety*

SS 01 91 02, *Colour Atlas*

3 Terms and definitions

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

3.1

accuracy of flow

difference between the indicated value and the actual value of the flow, expressed in percent

3.2

adjustable pressure regulator

pressure regulator that is provided with a means of operator adjustment of the outlet pressure

3.3

filling port

connector on the pressure regulator through which the cylinder is filled

3.4

flow outlet

outlet intended to deliver a controlled flow of gas

1) To be published. (Revision of ISO 10297:1999)

3.5

flowgauge

device that measures pressure and which is calibrated in units of flow

NOTE The flowgauge does not measure flow. It indicates flow by measuring the pressure upstream of a fixed orifice.

3.6

flowmeter

device that measures and indicates the flow of a specific gas or gas mixture

3.7

gas-specific

having characteristics that prevent connection between different gas services

3.8

gas-specific connection point

that part of the terminal unit which is the receptor for a gas-specific probe

3.9

nipple

that portion of a connector which is pushed into and secured within the bore (lumen) of a hose

3.10

nominal inlet pressure

P_1

upstream pressure (specified as a single value by the manufacturer) for which the pressure regulator is intended to be used

3.11

nominal outlet pressure

P_2

nominal downstream pressure

NOTE P_2 is specified by the manufacturer in the instructions for use.

3.12

pre-set pressure regulator

pressure regulator that is not provided with a means of operator adjustment of the outlet pressure

3.13

pressure gauge

device that measures and indicates pressure

3.14

pressure outlet

outlet intended to deliver gas at a controlled pressure

3.15

pressure regulator

device that reduces the inlet pressure and maintains the set outlet pressure within specified limits

3.16

pressure regulator integrated with cylinder valve

combination of a pressure regulator and cylinder valve intended to be permanently fitted to a medical gas cylinder

3.17

pressure-relief valve

device intended to relieve excess pressure at a pre-set value