

Safety of machinery — Safety requirements for fluid power systems and their components — Pneumatics

ICS 13.110; 23.140

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National foreword

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The start and finish of text introduced or altered by amendment is indicated in the text by tags. Tags indicating changes to CEN text carry the number of the CEN amendment. For example, text altered by CEN amendment A1 is indicated by A1 A1.

The UK participation in its preparation was entrusted by Technical Committee MCE/18, Fluid power systems and components.

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

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This British Standard, having been prepared under the direction of the Engineering Sector Board, was published under the authority of the Standards Board and comes into effect on
15 November 1996

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Amendments issued since publication

Date	Comments
30 April 2009	Implementation of CEN amendment A1:2008

The following BSI references relate to the work on this standard:
Committee reference MCE/18
Draft for comment 93/700546 DC

ISBN 978 0 580 618659

English Version

Safety of machinery - Safety requirements for fluid power systems and their components - Pneumatics

Sécurité des machines - Prescriptions de sécurité relatives
aux systèmes et leurs composants de transmissions
hydrauliques et pneumatiques - Pneumatique

Sicherheit von Maschinen - Sicherheitstechnische
Anforderungen an fluidtechnische Anlagen und deren
Bauteile - Pneumatik

This European Standard was approved by CEN on 11 March 1996 and includes Amendment 1 approved by CEN on 27 July 2008.

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Foreword

This document (EN 983:1996+A1:2008) has been prepared by Technical Committee CEN/TC 114 “Safety of machinery”, the secretariat of which is held by DIN.

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by publication of an identical text or by endorsement, at the latest by March 2009, and conflicting standards shall be withdrawn at the latest by December 2009.

This document includes Amendment 1, approved by CEN on 2008-07-27.

This document supersedes EN 983:1996.

The start and finish of text introduced or altered by amendment is indicated in the text by tags **A1** **A1**.

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).

A1 For relationship with EU Directive(s), see informative Annexes ZA and ZB, which are integral parts of this document. **A1**

It was developed to contribute towards unification of safety regulations and procedures in the various member countries for each aspect dealt within the field of pneumatics for fluid power systems and their components. This Standard utilizes the most recently validated technical information from established technical sources (e.g. CEN, ISO, national standards and European documents).

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Bulgaria, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland and United Kingdom.

Introduction

This standard is a type B2 standard (according to EN 292-1) and contains the general requirements for pneumatic systems and their components on machinery. For type C standard makers, it is a basis for the development of specific requirements on dedicated machines. If no type C standards are available, it is a basis for the manufacturers when constructing machines that include pneumatic systems and their components.

In developing this standard, safety related requirements out of ISO 4414 were selected as well as additional safety related requirements.

Equivalent safety requirements for hydraulic systems are defined in EN 982 "Safety of machinery – Safety requirements for fluid power systems and their components – Hydraulics".

1 Scope

This standard applies to pneumatic systems and their components on machinery. It identifies hazards and factors which affect the safety of systems and their components when they are put to their intended use.

Gas bottles and receivers are excluded from the scope of this standard. For receivers see EN 286-1.

The principles specified apply to the design, construction and modification of new systems and their components and aspects of use including:

- Assembly
- Installation
- Adjustment
- Operation
- Cleaning
- Maintenance.

Components are covered in the standard but only to the extent that safety requirements are given to allow the components to be safely integrated into a system's design.

The standard applies to systems and their components on machinery that are manufactured after the date of the adoption of this standard.

2 Normative references

This European Standard incorporates by dated or undated reference, provisions from other publications. These normative references are cited at the appropriate places in the text and the publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to this European Standard only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies.

EN 286-1, *Simple unfired pressure vessels designed to contain air or nitrogen – Part 1: Design, manufacture and testing*.

EN 292-1:1991, *Safety of machinery - Basic concepts, general principles for design — Part 1: Basic terminology, methodology*.

EN 292-2:1991, *Safety of machinery - Basic concepts, general principles for design — Part 2: Technical principles and specifications*.

EN 418, *Safety of machinery – Emergency stop equipment, functional aspects – Principles for design*.

prEN 954-1:1992, *Safety of machinery - Safety related parts of control systems — Part 1: General principles for design*.

prEN 1050:1992, *Safety of machinery - Risk assessment*.

ENV 1070, *Safety of machinery – Terminology*.

prEN 1127-1:1993, *Safety of machinery – Fire and explosions – Part 1: Explosion prevention and protection*.

EN 50081-2, *Electromagnetic compatibility – Generic emission standard – Part 2: Industrial environment*.

prEN 50082-2:1994, *Electromagnetic compatibility – Generic immunity standard – Part 2: Industrial environment*.

EN 60204-1:1992, *Safety of machinery - Electrical equipment of machines – Part 1: General requirements (IEC 204-1:1992, modified)*.

EN 60529, *Degrees of protection provided by enclosures (IP code) (IEC 529:1989)*.

ISO 1219-1, *Fluid power systems and components – Graphic symbols and circuit diagrams – Part 1: Graphic symbols*.

ISO/DIS 1219-2:1993, *Fluid power systems and components – Graphic symbols and circuit diagrams – Part 2: Circuit diagrams*.

ISO 5598, *Fluid power systems and components - Vocabulary*.

ISO/TR 11688-1, *Acoustics – Recommended practice for the design of low-noise machinery and equipment – Part 1: Planning*.

3 Definitions

For the purpose of this standard, the definitions of ENV 1070 and the following apply. Other definitions not included are given in ISO 5598.

3.1
fluid power
the means whereby signals and energy can be transmitted, controlled and distributed using a pressurized fluid as the medium

3.2
system
arrangement of interconnected components which transmits and controls fluid power energy

3.3
component
an individual unit (e.g. cylinder, motor, valve, filter) comprising one or more parts designed to be a functional part of a fluid power system

3.4
pneumatics
science and technology which deals with the use of air or neutral gases as the fluid power medium

3.5
maximum working pressure
the highest pressure at which the system or part of the system is intended to operate in steady-state conditions

3.6
rated pressure
the highest pressure at which the component is intended to operate for a number of repetitions sufficient to assure adequate service life

3.7
operating device
device that provides an input signal to a control mechanism (e.g. cam, switch)

3.8
control mechanism
a device that provides an input signal to a component (e.g. lever, solenoid)

3.9
actuator
component that transforms fluid energy into mechanical energy (e.g. motor, cylinder)

3.10
piping
any combination of fittings, couplings or connectors with pipes, hoses or tubes which allows fluid flow between components

3.11
neutral gas
a gas which has properties similar to air and does not react to the effects of pressure and/or temperature in a manner different to air