SLOVENSKI STANDARD
oSIST prEN 1012-1:2007

01-april-2007

Kompresorji in vakuumske ļ rpalke - Varnostne zahteve - 1. del: Kompresorji za zrak

Compressors and vacuum pumps - Safety requirements - Part 1: Air compressors

Compresseurs et pompes a vide - Prescriptions de sécurité - Partie 1 : Compresseurs d'air

Ta slovenski standard je istoveten z: **prEN 1012-1**

ICS:

23.080	Ļ rpalke	Pumps
23.140	Kompresorji in pnevmatiļ ni stroji	Compressors and pneumatic machines
23.160	Vakumska tehnologija	Vacuum technology

oSIST prEN 1012-1:2007 **en**

EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

DRAFT
prEN 1012-1

December 2006

ICS 23.080; 23.140; 23.160

Will supersede EN 1012-1:1996

English Version

Compressors and vacuum pumps - Safety requirements - Part 1: Air compressors

Compresseurs et pompes à vide - Prescriptions de sécurité - Partie 1 : Compresseurs d'air

This draft European Standard is submitted to CEN members for enquiry. It has been drawn up by the Technical Committee CEN/TC 232.

If this draft becomes a European Standard, CEN members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration.

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EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
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Ref. No. prEN 1012-1:2006: E

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Foreword

This document (prEN 1012-1:2006) has been prepared by Technical Committee CEN/TC 232 “Compressors - Safety”, the secretariat of which is held by SIS.

This document is currently submitted to the CEN Enquiry.

This document will supersede EN 1012-1:1996.

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, B, C or D, which is an integral part of this document.

The responsibility of CEN/TC 232 includes coordination of safety standards with CEN/TC 182, Refrigerating systems, safety and environmental requirements, and CEN/TC 234, Gas supply.

Annexes A, B and ZA to this European Standard are informative.

The standard is divided in three parts:

- EN 1012-1 Air compressors and compressed air systems

- EN 1012-2 Vacuum pumps

- EN 1012-3 Process compressors

PN18 Process committee WG producing EN 1012-3 seek advice and ask for a period of overlap between the replacement of the current EN 1012-1 and the revised version and the new part EN 1012-3.

This is to ensure that those compressor manufacturers using the current Part 1 as presumption of conformity with the Machines Directive are able to convert to Part 3 and retain the presumption of conformity for the Machines Directive during the changeover.

Introduction

This document is a type C standard as stated in EN 1070.

The machinery concerned and the extent to which hazards, hazardous situations and events are covered are indicated in the scope of this document.

When provisions of this type C standard are different from those which are stated in type A and B standards, the provisions of this type C standard take precedence over the provisions of the other standards for machines that have been designed and built according to the provisions of this type C standard.

This standard when published in 1996 applied to all types of compressors. It has now been decided to move all aspects related to process compressors into a new part of the EN 1012 series. It was considered a practical move so that if there were provisions that were laid down for compressors covered by CEN TC12 or ISO TC67 then any revision or amendments could be done to the process compressor part without affecting the provisions laid down for air compressors covered by this part of EN 1012.

1 Scope

RATIONALISE WITH DEFINITIONS FOR COMPRESSOR ETC

This Part of EN 1012 is applicable to compressors having an operating pressure greater than 0,5 bar and designed to utilise air, nitrogen or inert gases. The standard lists the significant hazards associated with compressors and specifies safety requirements applicable to the design, installation, operation, maintenance and dismantling of compressors during their foreseeable lifetime and subsequent disposal.

This part of EN 1012 includes under the general term compressors those machines which comprise;

— the compressor itself including its pressure vessels, coolers etc;

— a prime mover;

— any component or device supplied which is necessary for safe operation of the compressor.

In addition it applies to partly completed compressors having a compressor in combination with some of these components as well as compressor assemblies operating in combination.

This part covers the general requirements relating to process gas compressors and for specific requirements then EN 1012-3 applies.

This part of EN 1012 is not applicable to compressors which are manufactured before the date of publication of this document by CEN.

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 (including amendments).

EN 294, *Safety of machinery — Safety distances to prevent danger zones to be reached by the upper limbs*

EN 349, *Minimum distances to avoid crushing of parts of the human body*

EN 418, *Safety of machinery — Emergency stop equipment — Functional aspects*

EN 563, *Temperatures of touchable surfaces — Ergonomic data to establish temperature limit values for hot surfaces*

EN 614-1, *Safety of machinery. Ergonomic design principles. Terminology and general principles*

EN 626, *Safety of machinery — Principles for machinery manufacturers on the reduction of risk to health from hazardous substances emitted by machinery*

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

EN 953:1997, *Safety of machinery — Guarding of machinery — Fixed and movable*

EN 1127-1, *Safety of machinery - Fires and explosions — Part 1: Explosion prevention and protection*

EN ISO 2151, *Compressors and Vacuum Noise test code – Engineering Method (Grade 2)*

EN ISO 3457:2003, *Earth~-moving machinery — Guards and shields — Definitions and specifications*

EN ISO 4126-1, *Safety valves — Part 1: General requirements*

EN ISO 11201, *Acoustics -- Noise emitted by machinery and equipment -- Measurement of emission sound pressure levels at a work station and at other specified positions -- Engineering method in an essentially free field over a reflecting plane*

EN 11203:1995, Acoustics -- *Noise emitted by machinery and equipment. Determination of emission sound pressure levels at a work station and at other specified positions from the sound power level*

EN ISO 11688-1:1998, *Acoustics. Recommended practice for the design of low-noise machinery and equipment. Planning*

EN ISO/TR 11688-2:2001, *Acoustics. Recommended practice for the design of low-noise machinery and equipment. Introduction to the physics of low-noise design*

EN 12021:1999, *Respiratory protective devices. Compressed air for breathing apparatus*

EN 12100-1:2003, *Safety of machinery. Basic concepts, general principles for design. Basic terminology, methodology*

EN 12100-2:2003, *Safety of machinery. Basic concepts, general principles for design. Technical principles*

EN 13309:2000, *Construction machinery. Electromagnetic compatibility of machines with internal electrical power supply*

EN 13861:2002, *Safety of machinery. Guidance for the application of ergonomics standards in the design of machinery*

EN 15667:2000, *Acoustics. Guidelines for noise control by enclosures and cabins*

EN 61310-1:1995, *Safety of machinery - Indication, marking and actuation - Part 1: Requirements for visual, auditory and tactile signals*

EN 61310-2:1995, *Safety of machinery. Indication, marking and actuation. Requirements for marking*

ISO 3857-Part 1:1977, *Glossary of terms for compressors, pneumatic tools and machines. General*

ISO 3857-Part 2:1977, *Glossary of terms for compressors, pneumatic tools and machines. Compressors*

ISO 14119:1998, *Safety of machinery -- Interlocking devices associated with guards -- Principles for design and selection*

ISO 14163:1998, *Acoustics -- Guidelines for noise control by silencers*

EN 60417-2:1999, *Graphical symbols for use on equipment. Symbol originals*

EN 61000-6-4:2001, *Electromagnetic compatibility (EMC). Generic standards. Emission standard for industrial environments*

EN 61000-6-2:1999, *Electromagnetic compatibility (EMC). Generic standards. Immunity for industrial environments*

3 Terms and definitions

For the purposes of this standard, the definitions given in EN ISO 12100-1 apply. Definitions specifically needed for compressors are listed below and in the standard ISO 3857-1 and ISO 3857-2:

3.1 General terms

3.1.1
compressor
device which compresses air, gases or vapours to a pressure higher than the inlet.

3.1.2
compressor unit
comprises the compressor, drive system and ancillary equipment integrated for a specific application.

3.1.3
hazard
potential source of injury or damage to health

3.1.4
inert gases
chemically inactive gas which retains this characteristic even at elevated pressures.

3.1.5
pressure
pressure in this standard means effective (gauge) pressure unless otherwise stated.

NOTE The unit bar for pressure is used. 1 bar = 100 kPa.

3.1.6
liquid shock
the excessive force resulting from an attempt to compress incompressible media

3.1.7
maximum allowable working pressure
maximum pressure for which the compressor(s) or compressor assembly is designed, as specified by the manufacturer.

3.1.8
maximum allowable working temperature
maximum operating temperature, as specified by the manufacturer.

3.1.9
nominal discharge pressure
pressure at the outlet of the compressor, as specified by the manufacturer.

3.1.10
normal operating conditions
considered to be when the compressor is properly maintained and operated within admissible limits in particular ambient temperature, as specified by the manufacturer compressing the specified media.

3.1.11
tripping
automatic stopping of a compressor initiated by limiting device.

3.2 Specific terms

3.2.1
air compressor
compressor intended for compression of air, nitrogen or inert gases

3.2.2
compressor assembly
assembly of compressor unit(s) and ancillary equipment integrated for a specific application. The limits of the assembly are as defined by the manufacturer.

3.2.3
oil-free air compressor
compressor design in which the compressed air does not come in contact with oil

3.2.4
oil-lubricated air compressor
compressor design in which the compressed air may come in contact with oil but excluding oil-flooded air compressors

3.2.5
oil-flooded air compressor
compressor design in which the compressed air and the oil are mixed.

3.2.6
high pressure compressor
compressor for maximum allowable working pressures above 50 bar.

3.2.7 Portable compressor
3.2.7.1
portable compressor
compressor unit which is wheel mounted and can be towed

3.2.7.2
gross mass
maximum specified mass of the portable compressor including tools, equipment and fuel

3.2.8
skid-mounted compressor
compressor unit which is mounted on skids and which can be towed short distances or transported.

3.2.9
water-injected compressor
compressor design in which the compressed air and the water are mixed.

4 Summary of safety requirements and measures

4.1 Hazard analysis and risk assessment

To provide the suitable level of safety taking into consideration the design, guarding and the provision of information the appropriate risk assessment procedure shall be adopted in accordance with the principles identified in EN ISO 12100-1, EN ISO 12100-2 and EN 1050 (ISO 14121).

Hazards listed in Table 1 are related to all compressors within the scope of this standard. Indication of the type of verification adopted to establish that the identified hazard has been reduced to the lowest acceptable risk is given in the Table 1.

Table 1 — Hazard listing

Safety integration principle	Safety requirement	Visual check	Function check	Measurement	Reference to clauses of this standard covering safety integration			Reference to other standards
					Design	Guard	Warn	
Safety integration	Ergonomics	X	X		5.6		7.2.3, 7.2.4	EN 614-1 EN 13861
Controls	Safety system				5.6, 5.8.1	5.8.2	5.6.1, 5.8.1.1, 6.3.2, 7.3 8th indent	EN 953 EN 418 IEC 60417-2
	Emergency stop	X	X		5.8.7			EN 418 EN 61310-1
Mechanical hazards	Cutting, severing, drawing in, trapping, entanglement, friction and abrasion	x	X	x		5.1.1, 5.8.2	6.3.1, 7.2.8.1 b), c)	EN294 EN 349 EN 953 EN ISO 14119
	Ejection of parts	X	X		5.1.3, 8.1			
	Stability		X	x	5.1.4		7.2.8.1 d)	EN ISO 12100-2
	Guards	X	X		5.8.2			EN 953

continued