

**Kompressorid ja vaakumpumbad.
Ohutusnõuded. Osa 1: Kompressorid**

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

EESTI STANDARDI EESSÕNA

NATIONAL FOREWORD

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Descriptors: Compressors, vacuum pumps, safety requirements.

English version

Compressors and vacuum pumps

Safety requirements

Part 1: Compressors

Compresseurs et pompes à vide;
prescriptions de sécurité. Partie 1:
Compresseurs

Kompressoren und Vakuumpumpen;
Sicherheitsanforderungen. Teil 1:
Kompressoren

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Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the Central Secretariat or to any CEN member.

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CEN members are the national standards bodies of Austria, Belgium, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and United Kingdom.

CEN

European Committee for Standardization
Comité Européen de Normalisation
Europäisches Komitee für Normung

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Foreword

This European Standard has been prepared by Technical Committee CEN/TC 232 "Compressors - Safety", the secretariat of which is held by SIS.

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publication of an identical text or by endorsement, at the latest by October 1996, and conflicting standards shall be withdrawn at the latest by October 1996.

This European Standard 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 standard.

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and the United Kingdom.

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, C and ZA to this European Standard are informative, and Annex B is normative.

The standard is divided in two parts:

- EN 1012-1 Compressors
- EN 1012-2 Vacuum Pumps

1 Scope

This standard is applicable to all types of compressors. 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.

Compressors intended for use in special applications shall also comply with any specific standards relating to those applications.

This standard specifies safety requirements for all compressors and additional requirements for the following specific types:

Compressors for various types of gases

- oil-lubricated air compressors
- oil-flooded air compressors
- oil-free air compressors

- compressors for handling hazardous gases (gas compressors)
- compressors for handling oxygen
- compressors for handling acetylene

Compressors for extreme temperatures and pressures

- high pressure compressors, over 40 bar
- compressors for low inlet temperatures, below 0°C.

Other types of compressors

- large compressors (over 1000 kW, input power)
- portable and skid mounted air compressors
- compressors exposed for potentially explosive atmospheres

Exceptions

The following compressors are excluded from the scope of this standard:

- compressors having an shaft input power of less than 0,5 kW
- compressors for gases other than acetylene, having a maximum allowable working pressure of less than 0,5 bar,
- refrigerant compressors used in refrigerating systems or heat pumps as defined in EN 378.

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 the 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 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 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 378	Refrigerating systems and heat pumps - Safety and environmental requirements

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 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	Safety of machinery - Guarding of machinery - Fixed and moveable guards
EN 1127-1	Safety of machinery - Fires and explosions - Part 1: Explosion prevention and protection
ENV 1070	Safety of Machinery - Terminology
EN 12076	Acoustics - Noise test code for compressors and vacuum pumps (Grade 2)
EN 50 014	Electrical apparatus for potentially explosive atmospheres - General requirements
EN 50 081-2	Electromagnetic compatibility - Generic emission - Part 2: Industrial environment
EN 50 082-2	Electromagnetic compatibility - Generic immunity - Part 2: Industrial environment
EN 61310 -1	Safety of machinery - Indication, marking and actuation Part 1: Requirements for visual, auditory and tactile signals (IEC 1310-1:1995)
EN 60 204-1	Electrical Equipment of industrial machines - Part 1: General requirements
ISO 3457	Earth-moving machinery - Guards and shields - Definitions and specifications
ISO 3864	Safety colours and safety signs
ISO 3857-1	Compressors, pneumatic tools and machines - Vocabulary - Part 1: General
ISO 3857-2	Compressors, pneumatic tools and machines - Vocabulary - Part 2: Compressors
ISO 4126-1	Safety valves - Part 1: General Requirements

ISO 4871	Acoustics - Declaration and verification of noise emission values of machinery and equipment
ISO 6743-3A	Lubricants, industrial oils and related products (Class L) - Classification Part 3A: Family D (Compressors)
ISO 6743-3B	Lubricants, industrial oils and related products (Class L) - Classification Part 3B: Family D (Gas and refrigeration compressors)
ISO 7000	Graphical symbols for use on equipment - Index and synopsis
ISO/TR 11688-1	Acoustics - Recommended practice for the design of low-noise machinery and equipment - Part 1: Planning
IEC 417	Graphical symbols for use on equipment

3 Definitions

For the purposes of this standard, the definitions given in ENV 1070 apply. Definitions, specifically needed for compressors are listed below and in the standard ISO 3857-1 and ISO 3857-2.

3.1 General definitions

3.1.1 compressor: A machine which compresses air, gases or vapours to a pressure higher than the inlet pressure. A compressor comprises the bare compressor itself, the prime mover and any component or device supplied, which is necessary for safe operation of the compressor.

3.1.2 pressure: Pressure in this standard means effective (gauge) pressure unless otherwise stated.

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

3.1.3 nominal discharge pressure: The pressure at the outlet of the compressor, as specified by the manufacturer.

3.1.4 maximum allowable working pressure: The maximum operating pressure as specified by the manufacturer.

3.1.5 maximum allowable working temperature: The maximum operating temperature, as specified by the manufacturer.

3.1.6 hazardous gas or vapour: Gas or vapour with chemical, radioactive or biological properties (such as flammable, explosive, unstable, pyrogenic, corrosive, caustic, toxic, carcinogenic), which generate hazards by reactions inside the compressor or through dispersal or through reactions with the environment. A hazardous gas may be a mixture of gases with these properties.

3.1.7 tripping: Automatic stopping of a compressor initiated by limiting device.