

## **Pumbad ja pumbaüksused vedelike jaoks. Üldised ohutusnõuded**

Pumps and pump units for liquids - Common safety requirements

## EESTI STANDARDI EESSÕNA

## NATIONAL FOREWORD

<p>Käesolev Eesti standard EVS-EN 809:1999 sisaldab Euroopa standardi EN 809:1998 + AC:2001 ingliskeelset teksti.</p> <p>Käesolev dokument on jõustatud 23.11.1999 ja selle kohta on avaldatud teade Eesti standardiorganisatsiooni ametlikus väljaandes.</p> <p>Standard on kättesaadav Eesti standardiorganisatsioonist.</p>	<p>This Estonian standard EVS-EN 809:1999 consists of the English text of the European standard EN 809:1998 + AC:2001.</p> <p>This document is endorsed on 23.11.1999 with the notification being published in the official publication of the Estonian national standardisation organisation.</p> <p>The standard is available from Estonian standardisation organisation.</p>
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<p><b>Käsitlusala:</b></p> <p>Käesolev standard kehtestab tehnilised ohutusnõuded vedelikupumpade või pumbaüksuste konstrueerimise, kokkumonteerimise, paigalduse, töötamise, hooldamise kohta.</p>	<p><b>Scope:</b></p>
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**ICS** 23.080

**Võtmesõnad:** informatsioon, kokkumonteerimine, kontrollimine, mootorpumbad, märgistus, ohutusmeetmed, ohutusnõuded, pumbad, tehnilised andmed, utiliseerimine, vedelikud, õnnetuste ärahoidmine

ICS 23.080

Descriptors: Pumps, safety requirements.

**English version**

**Pumps and pump units for liquids  
Common safety requirements**

Pompes et groupes motopompes  
pour liquides – Prescriptions com-  
munes de sécurité

Pumpen und Pumpenaggregate für  
Flüssigkeiten – Allgemeine  
sicherheitstechnische Anforderungen

This European Standard was approved by CEN on 1997-11-07.

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.

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.

The European Standards exist in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CEN member into its own language and notified to the Central Secretariat has the same status as the official versions.

CEN members are the national standards bodies of Austria, Belgium, the Czech Republic, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, the Netherlands, Norway, Portugal, Spain, Sweden, Switzerland, and the 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 197 “Pumps”, the secretariat of which is held by AFNOR.

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 January 1999, and conflicting national standards shall be withdrawn at the latest by January 1999.

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, Czech Republic, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and the United Kingdom.

## Introduction

This Standard has been prepared to be a harmonized standard to provide one means of conformity with the Essential requirements of the Machinery Directive and associated EFTA Regulations.

The extent to which hazards are covered is indicated in clause 4 "List of hazards" of this Standard. In addition, machinery shall comply as appropriate with EN 292 for hazards which are not covered by this Standard.

## 1 Scope

This standard establishes the technical safety requirements for :

- constructing ;
- assembling ;
- erecting ;
- operating ;
- servicing ;

of a liquid pump or pump unit. It contains a list of significant hazards, which can arise with the use of a liquid pump or pump unit, and establishes the requirements and/or measures which will lead to a reduction of the risks.

Liquid pumps are described as :

- rotodynamic pumps ;
- rotary positive displacement pumps ;
- reciprocating displacement pumps ;

supplied separately without driver.

In general, pumps are defined as being terminated by their inlet and outlet connections as well as by their shaft ends.

Pump units comprise the liquid pump types above together with a driver (electric motor or i.c.-engine) including transmission elements, baseplates, and any auxiliary equipment.

This standard does not deal with the technical safety requirements for the design or manufacture of drivers nor of auxiliary equipment. It does not set down requirements for the risks directly arising from means provided for the portability, transportability, and mobility of pump units during or between periods of their operation, nor the requirements for transmission shafts linking a tractor or other selfpropelled machinery to a pump.

This standard does not cover pumps and pump units for applications which are excluded from the scope of EC Directive 89/392/EEC Machinery as follows :

- pumps and pump units whose only power source is directly applied manual effort ;
- pumps and pump units for medical use used in direct contact with the patient ;
- pumps and pump units specially designed or put into service for nuclear purposes which, in the event of failure, may result in an emission of radioactivity ;
- pumps and pump units for use on seagoing vessels or mobile off-shore units ;
- pumps and pump units specially designed for military or police purposes.

Neither does it cover pumps and pump units for hydraulic power transmission.

Specific requirements for particular features of pumps additional to the common requirements set out in this standard can be found in other standards such as prEN 1028, prEN 1151, prEN 1829, and in the European Standards on submersible pump units and for liquid pumps for the use in agrifoodstuff industries.

This Standard is for pumps and pump units which are placed on the market after the publication date of the 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 292-1, *Safety of machinery - Basic concepts - General principles for design - Part 1 : Basic terminology – Methodology.*

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

EN 292-2/A1, *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 being reached by the upper limbs.*

EN 349, *Safety of machinery - Minimum gaps to avoid crushing of parts of the human body.*

EN 414, *Safety of machinery - Rules for the drafting and presentation of safety standards.*

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

EN 563, *Safety of machinery - Temperatures of touchable surfaces - Ergonomics data to establish temperature limit values for hot surfaces.*

EN 626-1, *Safety of machinery - Reduction of risk to health from hazardous substances emitted by machinery - Part 1 : Principles and specifications for machinery manufacturers*

EN 626-2, *Safety of machinery - Reduction of risk to health from hazardous substances emitted by machinery - Part 2 : Methodology leading to verification procedures.*

EN 894-1, *Safety of machinery - Ergonomics requirements for the design of displays and control actuators - Part 1 : Human interactions with displays control actuators.*

EN 894-2, *Safety of machinery - Ergonomics requirements for the design of displays and control actuators - Part 2 : Displays.*

EN 894-3, *Safety of machinery - Ergonomics requirements for the design of displays and control actuators - Part 3 : Control actuators.*<sup>1)</sup>

EN 953, *Safety of machinery - General requirements for the design and construction of guards (fixed, movable).*

prEN 1028-1, *Fire fighting pumps - Part 1 : Requirements of fire fighting centrifugal pumps with primer.*

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<sup>1)</sup> In preparation

prEN 1028-2, *Fire fighting pumps - Part 2 : Testing of fire fighting centrifugal pumps with primer.*

prEN 1037, *Safety of machinery - Isolation and energy dissipation - Prevention of unexpected start-up.*

EN 1050, *Safety of machinery - Risk assessment.*

prEN 1151, *Pumps - Rotodynamic pumps - Circulation pumps having an electrical effect not exceeding 200 W for heating installations and domestic hot water installations - Requirements, testing, marking.*

prEN 1829, *High pressure cleaners - High pressure water jet machines - Safety requirements.*

prEN 12162, *Liquid pumps - Hydrostatic testing.*

prEN 12639, *Liquid pumps and pump units - Noise test code - Grade 2 and 3 of accuracy.*

EN 25199, *Technical specifications for centrifugal pumps - Class II.*

EN 50081-1, *Electromagnetic compatibility (EMC) - Generic emission standard - Part 1 : Residential, commercial and light industry.*

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

EN 50082-1, *Electromagnetic compatibility (EMC) - Generic immunity standard - Part 1 : Residential, commercial and light industry.*

EN 50082-2, *Electromagnetic compatibility (EMC) - Generic immunity standard - Part 2 : Industrial, environment.*

EN 60204-1, *Safety of machinery - Electrical equipment of machines - Part 1 : General requirements.*

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

ENV 61000-2-2, *Electromagnetic compatibility (EMC) - Part 2 : Environment ; Section 2 : Compatibility levels for low frequency conducted disturbances and signalling in public low-voltage power supply systems (IEC 1000-2-2:1990, modified).*

EN 61000-2-4, *Electromagnetic compatibility (EMC) - Part 2 : Environment - Section 4 : Compatibility levels in industrial plants for low frequency conducted disturbances (IEC 1000-2-4:1994 + Corrigendum 1994).*

EN 61000-3-2, *Electromagnetic compatibility (EMC) - Part 3 : Limits - Section 2 : Limits for harmonic current emissions (equipment input current  $\leq 16$  A per phase) (IEC 1000-3-2:1995).*

EN 61000-3-3, *Electromagnetic compatibility (EMC) - Part 3 : Limits - Section 3 : Limitation of voltage fluctuations and flicker in low-voltage supply systems for equipment with rated current  $\leq 16$  A (IEC 1000-3-3:1994).*

EN 61000-4-1, *Electromagnetic compatibility (EMC) - Part 4 : Testing and measurement techniques - Section 1 : Overview of immunity tests - Basic EMC publication (IEC 1000-4-1:1992).*

EN 61000-4-2, *Electromagnetic compatibility (EMC) - Part 4 : Testing and measurement techniques - Section 2 : Electrostatic discharge immunity test - Basic EMC publication (IEC 1000-4-2:1995).*

EN 61000-4-4, *Electromagnetic compatibility (EMC) - Part 4 : Testing and measurement techniques - Section 4 : Electrical fast transient/burst immunity test - Basic EMC publication (IEC 1000-4-4:1995).*

EN 61000-4-5, *Electromagnetic compatibility (EMC) - Part 4 : Testing and measurement techniques - Section 5 : Surge immunity test (IEC 1000-4-5:1995).*

EN 61000-4-7, *Electromagnetic compatibility (EMC) - Part 4 : Testing and measurement techniques - Section 7 : General guide on harmonics and interharmonics measurements and instrumentation, for power supply systems and equipment connected thereto (IEC 1000-4-7:1991).*

EN 61000-4-8, *Electromagnetic compatibility (EMC) - Part 4 : Testing and measurement techniques - Section 8 : Power frequency magnetic field immunity test - Basic EMC publication (IEC 1000-4-8:1993).*

EN 61000-4-9, *Electromagnetic compatibility (EMC) - Part 4 : Testing and measurement techniques - Section 9 : Pulse magnetic field immunity test - Basic EMC publication (IEC 1000-4-9:1993).*

EN 61000-4-10, *Electromagnetic compatibility (EMC) - Part 4 : Testing and measurement techniques - Section 10 : Damped oscillatory magnetic field immunity test - Basic EMC publication (IEC 1000-4-10:1993).*

EN 61000-4-11, *Electromagnetic compatibility (EMC) - Part 4 : Testing and measurement techniques - Section 11 : Voltage dips, short interruptions and voltage variations immunity tests (IEC 1000-4-11:1994).*

EN 61000-4-12, *Electromagnetic compatibility (EMC) - Part 4 : Testing and measurement techniques - Section 12 : Oscillatory waves immunity tests - Basic EMC publication (IEC 1000-4-12:1995).*

prEN 12723, *Liquid pumps - General terms for pumps and installations - Definitions, quantities, letter symbols and units.*

prEN ISO 14847, *Rotary positive displacement pumps - General requirements (ISO/DIS 14847 :1995).*

ISO 3864, *Safety colours and safety signs.*

ISO 9905, *Technical specifications for centrifugal pumps - Class I.*

ISO 9908, *Technical specifications for centrifugal pumps - Class III.*

### **3 Definitions**

For the purposes of this Standard, the definitions contained in prEN 12723 "Liquid pumps - General terms for pumps and installations - Definitions, quantities, letter symbols and units shall apply.

Further the following definition applies :

#### **3.1**

##### **Auxiliary equipment**

Components or sub-assemblies mounted as part of the pump unit and necessary for the operation of the pump or pump unit, for example, seal flush system, lubrication system, cooling system, etc..

### **4 List of hazards**

The significant hazards are set out in the following listing based on EN 292 Part 1 and EN 292 Part 2 as well as Annex 'A' of EN 292 Part 2 and on the basis of EN 1050. Also shown are the sections references in this standard in which the safety requirements and/or measures or rules are described for showing the conformity to the safety requirements. The arrangement of significant hazards which are treated in the standard correspond to EN 414 Annex 'A'.