
**Rotary positive displacement pumps —
Technical requirements**

Pompes volumétriques à mouvement rotatif — Prescriptions techniques

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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.

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.

International Standard ISO 14847 was prepared by the European Committee for Standardization (CEN) in collaboration with ISO Technical Committee ISO/TC 115, *Pumps*, Subcommittee SC 1, *Dimensions and technical specifications of pumps*, in accordance with the Agreement on technical cooperation between ISO and CEN (Vienna Agreement).

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Throughout the text of this standard, read "...this European Standard" to mean "...this International Standard...".

Annexes A and ZZ of this International Standard are for information only.

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International Organization for Standardization
Case postale 56 • CH-1211 Genève 20 • Switzerland
Internet iso@iso.ch

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Foreword

The text of EN ISO 14847:1998 has been prepared by Technical Committee CEN/TC 197 "Pumps", the secretariat of which is held by AFNOR, in collaboration with Technical Committee ISO/TC 115 "Pumps".

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of an identical text or by endorsement, at the latest by September 1999, and conflicting national standards shall be withdrawn at the latest by September 1999.

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.

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Introduction

This European Standard specifies all the technical requirements for rotary positive displacement pumps and rotary positive displacement pump units with the exception of safety and testing. Safety and testing of positive displacement pumps and pump units are specified in the following European Standards:

- EN 809 Pumps and pump units for liquids - General safety requirements
- prEN 12162 Liquid pumps - Procedure for hydrostatic testing
- EN Positive displacement pumps and pump units - Code for acceptance tests
 [WI 0197018]
- EN 12639 Liquid pumps and pump units - Noise test code - Grade 2 and 3 of accuracy

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1 Scope

This standard specifies the technical requirements, other than safety and testing, for rotary positive displacement pumps and rotary positive displacement pump units.

This standard does not apply to rotary positive displacement pumps for fluid power applications.

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 287-1	Approval testing of welders - Part 1: Steels
EN 287-2	Approval testing of welders - Part 2: Aluminium
EN 288-1	Approval of procedures for welding metallic materials - Part 1: General rules ISO 14847:1999
EN 288-2	Approval of procedures for welding metallic materials - Part 2: Arc welding
EN 288-3	Approval of procedures for welding metallic materials - Part 3: Arc welding steels
EN 809	Pumps and rotary positive displacement pump units for liquids - General safety requirements
EN 20898-1	Mechanical properties of fasteners - Part 1: Bolts, screws and studs (ISO 898-1: 1988)
EN 20898-2	Mechanical properties of fasteners - Part 2: Nuts with specified proof load values - Course thread (ISO 898-2: 1992)
prEN 1956	Non-destructive testing - Penetrant testing and magnetic particle testing - Viewing conditions
prEN 12162	Liquid pumps - Procedure for hydrostatic testing
prEN 12723	Liquid pumps - General terms for pumps and rotary positive displacement pump units, definitions, quantities, symbols and units

prEN ISO 4126-1	Safety devices for protection against excessive pressure - Part 1: Safety relief valves (ISO/DIS 4126-1: 1995)
prEN ISO 9934-1	Non-destructive testing - Magnetic particle inspection - General principles (ISO/DIS 9934-1: 1996)
ISO 7-1	Pipe threads where pressure-tight joints are made on the threads - Part 1: Designation, dimensions and tolerances
ISO 14	Straight-side splines for cylindrical shafts with internal centering - Dimensions, tolerances and verification
ISO 228-1	Pipe threads where pressure-tight joints are not made on the threads - Part 1: Designation, dimensions and tolerances
ISO/R 773	Rectangular or square parallel keys and their corresponding keyways (Dimensions in millimetres)
ISO/R 774	Taper keys with or without gib head and their corresponding keyways (Dimensions in millimetres)
ISO/R 775	Cylindrical and 1/10 conical shaft ends
ISO/775: ADD 1	Checking of the depth of keyways in conical shaft ends - Addendum 1
ISO 1027	Radiographic image quality indicators for non-destructive testing - Principles and identification
ISO 2491	Thin parallel keys and their corresponding keyways (Dimensions in millimetres)
ISO 2492	Thin taper keys with or without gib head and their corresponding keyways (Dimensions in millimetres)
ISO 3117	Tangential keys and keyways
ISO 3453	Non-destructive testing - Liquid penetrant inspection - Means of verification
ISO 3912	Woodruff keys and keyways.
ISO 4156	Straight cylindrical involute splines - Metric modules, side fit - Generalities, dimensions and inspection
ISO 7005-1	Metallic flanges - Part 1: Steel flanges
ISO 7005-2	Metallic flanges - Part 2: Cast iron flanges

ISO 7005-3	Metallic flanges - Part 3: Copper alloy and composite flanges
ISO 10375	Non-destructive testing - Ultrasonic inspection - Characterization of search unit and sound field

3 Definitions

For the purposes of this standard the definitions given in prEN 12723 apply together with the following:

3.1 rotary positive displacement pump: A machine in which liquid is trapped in confined volumes and transported from an inlet port to an outlet port by a rotational movement of the pumping element or elements.

NOTE: According to EN 809, pumps are defined as being terminated by their inlet and outlet branches as well as, in general, by their shaft ends without couplings.

3.2 rotary positive displacement pump unit: An assembly of a rotary positive displacement pump and its driver, with necessary transmission and structural supporting elements terminating at the connections for the inlet and outlet branches and at the energy supply to the driver.

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4 Information and requirements to be confirmed, agreed and documented

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4.1 Purchaser information

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The purchaser shall provide the supplier with the information necessary for the proper selection of a pump or pump unit. To facilitate this the data sheet included as annex A can be used. The selection shall consider all received and relevant information on performance requirements, environment and intended operating conditions. Any missing information necessary for pump selection shall be requested by the supplier.

The purchaser's information shall include specification of options and items for special agreement according to this Standard and, where applicable, requests for deviations from this Standard. Clauses of this Standard referring to options and special agreements are listed in 4.2 and 4.3.

4.2 Optional requirements

If the purchaser wishes to include any of the optional requirements given in this standard such requirements shall be specified and documented at the time of enquiry and confirmed at the time of order. See clauses:

- 6.5.2 constant level oilers;
- 6.7.1 flanged or screwed connections;
- 6.7.1 studded flange facings;
- 6.7.1 alternative flange specifications;
- 6.7.1 alternative pipe thread specifications;
- 6.9.2 alternative connection specifications for auxiliary ports.

4.3 Items to be agreed

Items to be agreed between purchaser and supplier shall be fully documented at the time of placing the order. See clauses:

- 7.4 Baseplates;
- 7.4.1 drain rim baseplates;
- 7.4.1 special alignment facilities for baseplates;
- 7.6.2.2 systems for heating/cooling;
- 13.6 Installation / operating instructions

5 Fitness for purpose

The design and selection of the pump and pump components shall be compatible with the liquid, environment and operating conditions supplied by the purchaser in accordance with clause 4.

6 Pump design

6.1 Environmental conditions

Pumps and rotary positive displacement pump units shall be designed to operate under the following normal conditions:

- minimum air temperature 2 °C;
- maximum air temperature 40 °C;
- maximum relative humidity 80 %.

If unusual environmental or operating conditions, such as those listed below, have been specified by the purchaser at the time of enquiry, the pump shall be designed to meet these requirements:

- ambient temperatures or humidity deviating from the above values;
- exposure to direct sunlight;
- atmospheric pollution including airborne solids;
- biological attack;
- wetting by directed water;
- cleaning by hot water, steam or chemicals;
- external shock or vibration;
- lack of ventilation;
- flooding;
- extended periods of shut-down.

6.2 Basic design criteria

Pumps shall be designed to operate continuously as well as intermittently with any combination of parameters supplied by the purchaser in accordance with clause 4.

Consideration shall be given during design to the handling of components and assemblies when erecting, assembling and maintaining the pump/pump unit. Facilities shall be provided, where necessary, for jacking bolts, extraction screws, locating dowels and spigots and lifting eyes.

Designs shall comply with the safety requirements of EN 809.

6.3 Design of structural and pressure containing parts

The design of the pump and pump unit components shall be suitable for the operating conditions and for the environment specified.

6.4 Sealing systems

All shafts extending outside of enclosed machinery shall be fitted with a suitable seal. The seal shall be selected and installed according to the seal manufacturer's recommendations for the operating conditions.

6.5 Bearing lubrication (standards.iteh.ai)

6.5.1 If grease lubricated bearings need re-lubrication during their service life of the pump, suitable means for re-lubrication shall be provided.

6.5.2 Oil lubricated bearings which are not lubricated by the process liquid shall be fitted with an oil reservoir with a visual oil level indicator. Adding or draining oil shall be accomplished without disassembly other than plugs or breathers.

NOTE: Constant level oilers may be used providing the working oil level is clearly marked on the bearing housing.

6.6 Shafts

6.6.1 Shafts with rectangular or square parallel keys shall comply with ISO/R 773 or ISO 2491.

6.6.2 Shafts with tapered keys shall comply with ISO/R 774 or ISO 2492.

6.6.3 Shafts with parallel or tapered ends for couplings shall comply with ISO/R775 and ISO 775 Addendum 1 for inspection of keyway depths.

6.6.4 Shafts with tangential keys shall comply with ISO 3117.

6.6.5 Shafts with Woodruff keys shall comply with ISO 3912.

6.6.6 Splined shafts shall comply with ISO 14 or ISO 4156.