

**Power transformer and reactor fittings -
Part 7: Electric pumps for transformer
oil**

Power transformer and reactor fittings - Part 7:
Electric pumps for transformer oil

EESTI STANDARDI EESSÕNA

NATIONAL FOREWORD

<p>Käesolev Eesti standard EVS-EN 50216-7:2003 sisaldab Euroopa standardi EN 50216-7:2002 ingliskeelset teksti.</p> <p>Käesolev dokument on jõustatud 15.01.2003 ja selle kohta on avaldatud teade Eesti standardiorganisatsiooni ametlikus väljaandes.</p> <p>Standard on kättesaadav Eesti standardiorganisatsioonist.</p>	<p>This Estonian standard EVS-EN 50216-7:2003 consists of the English text of the European standard EN 50216-7:2002.</p> <p>This document is endorsed on 15.01.2003 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>Käsitlusala: This standard specifies the earthing terminals for immersed and dry-type transformers from 50 kVA to 10000 kVA. This standard specifies the shape and the dimensions of different earthing terminals. The device shall ensure continuous electrical conductivity. There are two types, according to the practice of different countries.</p>	<p>Scope: This standard specifies the earthing terminals for immersed and dry-type transformers from 50 kVA to 10000 kVA. This standard specifies the shape and the dimensions of different earthing terminals. The device shall ensure continuous electrical conductivity. There are two types, according to the practice of different countries.</p>
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EUROPEAN STANDARD

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English version

**Power transformer and reactor fittings
Part 7: Electric pumps for transformer oil**

Accessoires pour transformateurs
de puissance et bobines d'inductance
Partie 7: Pompes électriques
pour transformateur immergé

Zubehör für Transformatoren
und Drosselspulen
Teil 7: Elektrische Pumpen
für Transformatorenöl

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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 CENELEC member.

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

CENELEC members are the national electrotechnical committees of Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Malta, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and United Kingdom.

CENELEC

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

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Foreword

This European Standard was prepared by the Technical Committee CENELEC TC 14, Power transformers.

The text of the draft was submitted to the formal vote and was approved by CENELEC as EN 50216-7 on 2001-07-01.

The following dates were fixed:

- latest date by which the EN has to be implemented at national level by publication of an identical national standard or by endorsement (dop) 2002-08-01
- latest date by which the national standards conflicting with the EN have to be withdrawn (dow) 2004-08-01

EN 50216-7 is to be read in conjunction with EN 50216-1.

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1 Scope

EN 50216-7 covers requirements for electric pumps which generate the circulation of insulating oil in transformers and reactors conforming to the EN 60076 series and their associated cooling systems.

The pumps covered in this standard are rotodynamic pumps driven by a squirrel cage induction motor which is immersed in the insulating oil.

Pump sets conforming to this standard may be of in-line or end suction design.

This standard includes requirements for the electrical and hydraulic performance, mechanical design, routine testing and type testing. Additionally, performance and dimensions of preferred sizes of pump sets are specified (see normative annexes A and B).

The insulating oils considered comply with subclause 2.5 of IEC 60296-1. If other insulating liquids are to be used, the performance and design of the pump shall be agreed between purchaser and manufacturer.

2 Normative references

Addition to EN 50216-1:

EN 809	1998	Pumps and pump units for liquids - Common safety requirements
EN 60034-1	1998	Rotating electrical machines - Part 1: Rating and performance (IEC 60034-1:1996, mod)
EN 60034-9	1997	Rotating electrical machines - Part 9: Noise limits (IEC 60034-9:1997)
EN 60076	Series	Power transformers (IEC 60076 series, mod)
EN 60076-1	1997	Power transformers - Part 1: General (IEC 60076-1:1993, mod)
HD 53.8 S5	1998	Rotating electrical machines - Part 8: Terminal markings and direction of rotation of rotating machines (IEC 60034-8:1972 + A1:1990 + A2:1996)
HD 566 S1	1990	Thermal evaluation and classification of electrical insulation (IEC 60085:1984)
IEC 60279	1969	Measurement of the winding resistance of an a.c. machine during operation at alternating voltage
ISO 179	1993	Determination of Charpy impact strength
ISO 185	1988	Grey cast iron - Classification
ISO 281	1990	Rolling bearings - Dynamic load ratings and rating life
ISO 3522	1984	Cast aluminium alloys - Chemical composition and mechanical properties

ISO 4406	1989	Hydraulic fluid power - Fluids - Methods for coding level of contamination by solid particles
ISO 7005-2	1988	Metallic flanges - Part 2: Cast iron flanges
ISO 9906	1999	Rotodynamic pumps - Hydraulic performance acceptance tests - Grades 1 and 2

3 Definitions

For the purpose of this standard, the following definitions apply:

3.1

in-line pump

a pump having the suction and delivery flanges on the same axis. It can be of the centrifugal or helicoidal type. For transformer oil pumps, the axis of the flanges generally corresponds to the axis of rotation of the pump rotor

3.2

end suction pump

a pump having the suction and delivery flanges on perpendicular axes. It can be of the centrifugal type only. The axis of the suction flange corresponds to the axis of rotation of the pump rotor.

4 Design

4.1 General

The requirements of EN 50216-1, including maximum oil temperature [115 °C], shall apply to equipment covered by this standard. Minimum oil temperature shall be in accordance with EN 60076-1 [-25 °C].

All pumps shall conform to the essential health and safety requirements in accordance with EN 809.

Motor cooling and bearing lubrication shall be by circulation of the oil being pumped. Where rolling element bearings are used, they shall be of standard design with life in accordance with ISO 281 exceeding 200 000 hours at rated conditions. The expected life of the pump without bearing change shall not restrict the expected life of the transformer under normal service conditions.

Pumps shall be suitable for mounting with the axis of the rotating unit either horizontal or vertical. If other positions are to be used, this shall be made known to the manufacturer.

A mechanical or electrical device shall be fitted, unless otherwise agreed by the purchaser, to allow the direction of rotation to be determined. Reverse rotation shall not cause damage to the pump.

All enclosures for electric pumps shall be manufactured to give, as a minimum, protection in accordance with IP 54 of EN 60529.