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Power transformers - Part 22-5: Power transformer and reactor fittings - Electric pumps for transformers

EESTI STANDARDI EESSÕNA

NATIONAL FOREWORD

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English Version

Power transformers - Part 22-5: Power transformer and reactor fittings - Electric pumps for transformers (IEC 60076-22-5:2021)

Transformateurs de puissance - Partie 22-5 : Accessoires pour transformateurs de puissance et bobines d'inductance
- Electropompes pour transformateurs
(IEC 60076-22-5:2021)

Leistungstransformatoren - Teil 22-5: Zubehörteile von Leistungstransformatoren und Drosselspulen - Pumpen
(IEC 60076-22-5:2021)

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European foreword

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IEC 60076-6 NOTE Harmonized as EN 60076-6

INTERNATIONAL STANDARD

NORME INTERNATIONALE

**Power transformers –
Part 22-5: Power transformer and reactor fittings – Electric pumps for
transformers**

**Transformateurs de puissance –
Partie 22-5: Accessoires pour transformateurs de puissance et bobines
d'inductance – Électropompes pour transformateurs**



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INTERNATIONAL STANDARD

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CONTENTS

FOREWORD.....	4
1 Scope.....	6
2 Normative references	6
3 Terms and definitions	7
4 Service conditions	7
4.1 General.....	7
4.2 Degree of protection of electrical components (IP)	8
4.3 External corrosion protection	8
4.4 Internal corrosion protection	8
4.5 Insulating liquid characteristics	8
5 General characteristics and requirements.....	8
5.1 Rating plate information	8
5.2 Direction of liquid flow and rotation	9
5.3 General mechanical requirements.....	9
5.4 Casing or enclosure.....	9
5.5 Terminal box.....	10
5.6 Materials.....	10
5.7 Preferred sizes	10
5.8 Performance requirements	10
5.8.1 General	10
5.8.2 Hydraulic performance.....	11
5.8.3 Hydraulic interchangeability.....	11
5.8.4 Electrical performance	12
5.8.5 Noise	13
5.9 Tests	13
5.9.1 General	13
5.9.2 List of tests.....	13
5.9.3 Routine tests	13
5.9.4 Type tests.....	14
5.9.5 Special tests.....	15
Annex A (informative) Preferred sizes of end suction pumps.....	16
Annex B (informative) Preferred sizes of in-line pumps	18
Annex C (informative) Information required with enquiry, proposal and purchase order.....	19
Annex D (informative) Example of use of hydraulic interchangeability tolerances.....	20
Bibliography.....	24
Figure 1 – Hydraulic interchangeability across the allowable operating range	11
Figure 2 – Hydraulic interchangeability across an actual flow range.....	12
Figure A.1 – Dimensions of end suction pumps.....	16
Figure B.1 – Dimensions of in-line pumps	18
Figure D.1 – Pressure-flow characteristics	20
Figure D.2 – Tolerances as given in 5.8.3 applied to pump A	21
Figure D.3 – Pressure-flow characteristic of pump B superimposed on the characteristic of pump A	22

Figure D.4 – Pressure-flow characteristic of pumps C and D superimposed on the characteristic of pump A	22
Figure D.5 – Flow ranges	23
Table A.1 – Dimensions of preferred sizes of end suction pumps (mm).....	17
Table B.1 – Dimensions of preferred sizes of in-line pumps (mm)	18

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POWER TRANSFORMERS –

**Part 22-5: Power transformer and reactor fittings –
Electric pumps for transformers**

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IEC 60076-22-5 has been prepared by IEC technical committee 14: Power transformers. It is an International Standard.

The text of this International Standard is based on the following documents:

Draft	Report on voting
14/1021/CDV	14/1040A/RVC

Full information on the voting for its approval can be found in the report on voting indicated in the above table.

The language used for the development of this International Standard is English.

This document was drafted in accordance with ISO/IEC Directives, Part 2, and developed in accordance with ISO/IEC Directives, Part 1 and ISO/IEC Directives, IEC Supplement, available at www.iec.ch/members_experts/refdocs. The main document types developed by IEC are described in greater detail at www.iec.ch/standardsdev/publications.

A list of all parts in the IEC IEC 60076 series, published under the general title *Power transformers*, can be found on the IEC website.

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POWER TRANSFORMERS –

Part 22-5: Power transformer and reactor fittings – Electric pumps for transformers

1 Scope

This part of IEC 60076 covers electric pumps used in the cooling circuits of power transformers and reactors. It applies to electric pumps mounted on liquid immersed power transformers according to IEC 60076-1 and reactor pumps according to IEC 60076-6 with and without conservator for indoor or outdoor installation.

It outlines the operation 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 in informative annexes.

The pumps covered in this document are rotodynamic pumps driven by a squirrel cage induction motor that is immersed in the insulating liquid.

Pump sets conforming to this document can be of in-line or end suction design.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

IEC 60034-1:2017, *Rotating electrical machines – Part 1: Rating and performance*

IEC 60034-5, *Rotating electrical machines – Part 5: Degrees of protection provided by the integral design of rotating electrical machines (IP code) – Classification*

IEC 60034-9, *Rotating electrical machines – Part 9: Noise limits*

IEC 60076-1:2011, *Power transformers – Part 1: General*

IEC 60076-7, *Power transformers – Part 7: Loading guide for mineral-oil-immersed power transformers*

IEC 60085, *Electrical insulation – Thermal evaluation and designation*

IEC 60296, *Fluids for electrotechnical applications – Mineral insulating oils for electrical equipment*

IEC 60529, *Degrees of protection provided by enclosures (IP Code)*

ISO 179-1:2010, *Plastics – Determination of Charpy impact properties – Part 1: Non-instrumented impact test*

ISO 185, *Grey cast irons – Classification*

ISO 281, *Rolling bearings – Dynamic load ratings and rating life*

ISO 3522, *Aluminium and aluminium alloys – Castings – Chemical composition and mechanical properties*

ISO 4406, *Hydraulic fluid power – Fluids – Method for coding the level of contamination by solid particles*

ISO 7005-2, *Metallic flanges – Part 2: Cast iron flanges*

ISO 9906, *Rotodynamic pumps – Hydraulic performance acceptance tests – Grades 1, 2 and 3*

ISO 12944 (all parts), *Paints and varnishes – Corrosion protection of steel structures by protective paint systems*

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

- IEC Electropedia: available at <http://www.electropedia.org/>
- ISO Online browsing platform: available at <http://www.iso.org/obp>

3.1

electric pump

<for transformers> component that circulates insulating liquid through the cooling system and the transformer

Note 1 to entry: Two pump designs are considered: in-line and end suction pumps.

3.2

in-line pump

pump having the suction and delivery flanges on the same axis

Note 1 to entry: They can be of the centrifugal or propeller type; the axis of the flanges generally corresponds to the axis of rotation of the pump rotor.

3.3

end suction pump

pump having the suction and delivery flanges on perpendicular axes

Note 1 to entry: They can be of the centrifugal type only; the axis of the suction flange corresponds to the axis of rotation of the pump rotor.

4 Service conditions

4.1 General

The service conditions set out in IEC 60076-1:2011, 4.2 represent the normal scope of operation of the equipment specified in this document. For any unusual service conditions which require special consideration in the design of the equipment see IEC 60076-1:2011, 5.5. Operation under such unusual service conditions shall be subject to agreement between the purchaser and supplier, as they require special consideration in the design of the equipment.