

Russian books on reactors, special transformers and related to transformer engineering - Part IV

1980

E. L. Kaganovich, N. M. Rakkhlin, *Testing transformers up to 6300 kVA and voltages up to 35 kV (Transformer Series, Vol. 37)* (Испытания

трансформаторов мощностью до 6300 кВА и напряжением до 35 кВ (Трансформаторы, вып. 37), Energy, Moscow, 176 pages, 1980
<http://padabum.com/d.php?id=222443>

L. Kish, *The heating and cooling of transformers (Transformer Series, Vol. 36)* (Нагрев и охлаждение трансформаторов (Трансформаторы, вып. 36)), Energy, Moscow, 180 pages, 1980
<http://padabum.com/d.php?id=222468>

Based on the experimental studies conducted, the author considers the processes of oil and air movement and the conditions of heat exchange in internal and external cooling systems of the transformer. All conclusions and analytical solutions are obtained based on the basic fundamental laws of hydrodynamics and heat transfer (Bernoulli equation of motion, Fourier heat equation, Newton heat transfer equation and heat balance equation).

1982

V. S. Anshin, A. G. Krajz, V. G. Majkson, *The transformers for industrial furnaces (Transformer Series, Vol. 39)* (Трансформаторы для промышленных электропечей (Трансформаторы, вып. 39)), Energoizdat, Moscow, 296 pages, 1982
<http://padabum.com/d.php?id=220646>

Modes of operation and design of transformers for industrial furnaces. Their classification, main parameters and characteristics, regulation schemes, isolation and overvoltage issues. The data on electrical furnace transformers for arc steel-making, induction, ore-thermal furnaces, electroslag remelting plants are given.

M. V. Antonov, L. S. Gerasimova, *The technology for the production of electrical machines* (Технология производства электрических машин), Energoatomizdat, Moscow, 512 pages, 1982
<https://www.twirpx.com/file/25733/>

ABSTRACT

We present to you this last part of the bibliography of Russian books on power transformers. It is dedicated to reactors, special transformers and related to transformer engineering for the period 1980–April 2020. It also has a section on Russian transformer books translated into English.

KEYWORDS

reactors, Russian transformer books in English, special transformers



Technological processes for the production of electrical machines and power transformers are described.

1983

R. A. Lipstein, M. I. Shakhnovich, *Transformer oil* (Трансформаторное масло), Ed. 3, Energoatomizdat, 296 pages, 1983
<https://www.twirpx.com/file/64848/>

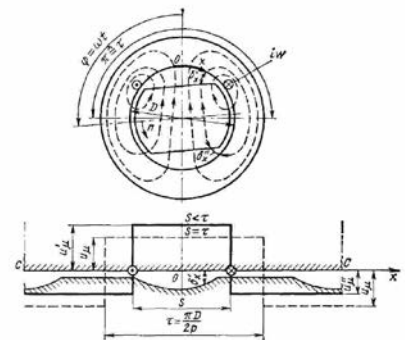
Data on the composition, methods of purification and production, and on the operational properties of transformer oils are provided. Additives to oils that increase their durability and electrophysical characteristics are described, issues of the mutual influence of oil and solid materials used in transformer construction, as well as methods for protecting oil from oxidation and moisture, are considered. Information is provided on domestic and some foreign transformer oils, on their aging in operation, mixing procedures, quality control and shifts. For engineering workers.

More than half a century has passed since the first edition of the book. The second edition was published in 1968. The third edition was revised considering the developments up to 1982. But even today, the book is not obsolete with respect to the technical information covered.

1986

Y. Turovsky, *The electromagnetic calculations of the electrical machine elements* (Электромагнитные расчеты элементов электрических машин), Energoatomizdat, Moscow, 200 pages, 1986
http://bamper.info/510-turovskij_a_elek-tromagnitnye_rascety_elementov_el.html

The application, theory and methods of electrodynamics for electromagnetic calculations of structural elements of electrical machines, transformers, electrical apparatuses and other electrical devices are considered.



1988

M. I. Sachs, B. A. Kagansky, A. A. Pechenin, *The transformers for electrical arc welding* (Трансформаторы для электродуговой сварки), Energoatomizdat, Leningrad, 136 pages, 1988
<http://books.totalarch.com/n/3416>

1989

A. S. Zasytkin, *The relay protection of transformers* (Релейная защита

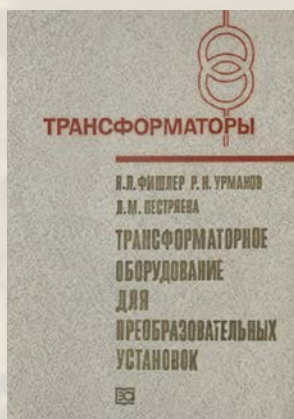
Some of today's hot topics covered in the Russian literature related to transformer technology are the computer-aided design of high voltage transformers and reactors, and the design of the on-load tap-changers

трансформаторов), Energoatomizdat, Moscow, 240 pages, 1989
<https://www.studmed.ru/zasyupkin-as-releynaya-zaschita-transformatorov-3176d5daf29.html>

All characteristics and types of transformer modes, as well as current forms in protective current transformers are considered, requirements for protection against internal short circuits are formulated, new devices with improved technical perfection are described.

J. L. Fishler, R. N. Urmanov, L. M. Pestryaeva, *The transformer equipment for convertors (Transformer Series, Vol. 41)* (Трансформаторное оборудование для преобразовательных установок (Трансформаторы, вып. 41)), Energoatomizdat, Moscow, 320 pages, 1989
<https://www.twirpx.com/file/960470/>

The features of the theory, calculation, design, testing and operation of converter transformers for various conversion schemes are described, and the main attention is paid to the analysis of modes and electromagnetic processes.



V. N. Sergeenkov, V. M. Kiselev, N. A. Akimova, *The electrical machines: The transformers* (Электрические машины: Трансформаторы), Higher School, Moscow, 352 pages, 1989
<https://www.i-mash.ru/forum/biblioteka/file/6463-sergeenkov-bn-kiselev-vm-akimova-na-elektriche/>

The problems of the theory of electromagnetic processes, the design of magnetic circuits, windings, insulation, cooling systems, voltage control systems and test methods of modern transformers of general and special purpose are considered.

1990

Z. A. Ryskova, P. D. Fedorov, V. I. Zimereva, *The transformers for electrical contact welding* (Трансформаторы для электрической контактной сварки), Energoatomizdat, Leningrad, 424 pages, 1990
<http://books.totalarch.com/node/5938>

1991

S. S. Vdovin, *The design of pulse transformers* (Проектирование импульсных трансформаторов), Ed. 2, Energoatomizdat, Leningrad, 208 pages, 1991
<http://www.toroid.ru/VdovinSS2.html>

The fundamentals of theory, design and calculation methods of pulse transformers for powerful systems in modern fields of applied physics are considered.

1999

V. P. Metelskij, *Improving the design of power transformers supplying consumers with abruptly variable loads* (Совершенствование конструкции силовых трансформаторов, питающих потребителей резкопеременных нагрузок), Institute of Electrodynamics of NAS of Ukraine, Kiev, 191 pages, 1999

2001

F. G. Aliev, A. K. Goryunov, A. N. Evseev et al., *The overvoltages in the neutral of the 6–220 kV power transformers and methods for their limitation* (Перенапряжения в нейтрали силовых трансформаторов 6–220 кВ и методы

их ограничения), PEIPK, St. Petersburg, 120 pages, 2001
<https://www.twirpx.com/file/2690761/>

2002

S. I. Lutidze, E. A. Jafarov, *The superconducting transformers* (Сверхпроводящие трансформаторы), Energoatomizdat, Moscow, 320 pages, 2002
<https://www.twirpx.com/file/1543463/>

The book outlines the electrodynamics of a superconductor and the basis for designing superconducting wires and superconducting windings.

2005

Y. N. Starodubtsev, *The theory and calculation of the small power transformers* (Теория и расчет трансформаторов малой мощности), IP RadioSoft, 320 pages, 2005
<https://www.studmed.ru/starodubcev-yun-teoriya-i-raschet-transformatorov-maloy-moschnosti-e2f4ff718c6.html>

The book provides the theory and calculation of six main types of transformers: power transformers, current and voltage transformers, matching signal transformers, audio frequency transformers, pulse transformers. Their general features and approximations, which are used in the calculation of specific types of transformers, are highlighted. The basic formulas, order and examples of calculation of transformers using modern amorphous and nanocrystalline alloys are given.

2008

A. I. Voldek, V. V. Popov, *The electrical machines. Introduction to the electromechanics. DC machines and transformers* (Электрические машины. Введение в электромеханику. Машины

постоянного тока и трансформаторы), Piter, St. Petersburg, 320 pages, 2008
https://www.studmed.ru/voldek-ai-popov-vv-elektricheskie-mashiny-vvedenie-v-elektromekhaniku-mashiny-postoyannogo-toka-i-transformatory_e5f432aedc2.html

The book discusses the physical and theoretical foundations of electromechanical energy conversion in electrical machines, sets out structural schemes for various types of electrical machines and the methodological foundations of their research, analyzes their consumer and operational characteristics and qualities, as well as the principles of controlling electrical machines. It is a textbook for high schools.

2010

The controlled shunt reactors. The digest of articles (Управляемые подмагничиванием электрические реакторы. Сборник статей), Edited by A. M. antsev, Znak, Moscow, 264 pages, 2004, Ed. 2, 288 pages, 2010
<http://eskomoscow.com/upload/iblock/15d/tyko.pdf>

Variable shunt reactors have been widely used in the electrical power industry in recent years. In the networks of 110, 220, 330, and 500 kV, dozens of three-phase variable shunt reactors with capacity of 25, 100, and 180 MVA are operated. A stable market for arc suppression reactors is there in networks of 6–10 kV. The book contains articles on the theory and methods of designing reactors, the experience of development, production, testing, implementation and operation.



In the last quarter of a century, high-voltage electric reactors have become widespread. The world's first books on this topic (authors A. Bryantsev, G. Evdokunin, M. Biki, A. Dolgoplov) reflect the practice of Ukrainian and Russian transformer plants.

2013

The bias-controlled shunt reactors. Digest of articles (Управляемые подмагничиванием шунтирующие реакторы. Сборник статей), edited by G. A. Evdokunin, Rodnaya Ladoga, St. Petersburg, 280 pages, 2013
<http://rodnayaladoga.ru/issues/books/evdokunin.pdf>

The book analyzes steady and transient processes in electrical systems in which controlled (variable) shunt reactors are installed. Illustrations of the various operating modes of the reactors are given on the basis of a careful computer simulation of both the electrical system itself and the controlled the reactor.

2014

M. A. Biki, *The design of reactors for the high voltage lines of direct and alternating current* (Проектирование электрических реакторов для высоковольтных линий электропередач на постоянном и переменном токе), Monolith, Dnepropetrovsk, 164 pages, 2014
<https://www.twirpx.com/file/2708392/>

The book provides basic information necessary for the calculation and design of electrical reactors used in high-voltage power lines of direct and alternating current. The principles of operation of the reactors, types of reactors for their intended purpose, varieties of design circuits and electrical connections, technical requirements for reactors, methods for calculating the main parameters, issues related to magnetic circuits, as well as methods for optimizing parameters are given.

A. G. Dolgoplov, *The controlled shunt reactors. Principle of operation, design, operation modes, relay protection and automation*, (Управляемые шунтирующие реакторы. Принцип действия, конструкции, режимы работы, релейная защита и автоматика), Energy, Moscow, 120 pages, 2014
<https://litmy.ru/knigi/tehnicheskie-nauki/335904-upravlyaemye-shuntiruyushchie-reaktory-princip-deystviya-konstrukcii-rezhimy-raboty-reley-naya-zaschita-i-avtomatika.html>

The book contains information about a new type of electrical power equipment - controlled shunt reactors. A classification is given and differences in the performance of varieties of controlled reactors are shown. Consideration of the features of the designs and modes of these devices as an object of relay protection.

2017

B. A. Arzhanikov, *The on-load voltage control devices for converter transformers* (Устройства регулирования напряжения преобразовательных трансформаторов под нагрузкой), UR-GUPS, Yekaterinburg, 101 pages, 2017
<https://www.twirpx.com/file/2408017/>

Several thyristor control methods for switching and a new method for electronic control of thyristor switches for on-load tap-changing of transformers are presented. The basic relationships and operating modes of the transformer with thyristor-reactor on-load tap-changer, (with common primary neutral or separate two neutrals), are considered. For transformers with wide range on-load tap-changers, a new circuit of a thyristor switching device with a protective and control electromagnetic element is considered.

It is impressive how Russian books were translated to the English language during the 1960s, 70s and 80s, some of them during the Cold War, which proves their high-quality

C. Russian Transformer books Translated into English

1950

N. I. Bulgakov, *The transformer design*, Mir Publishers, Moscow, 1950

1966

E. Minsker, V. Anshin, *Assembly of power transformers*, Mir Publishers, 283 pages, 1966

https://www.estantevirtual.com.br/sebopaulistano/minsker-anshin-assembly-of-power-transformers-atencao-a-descricao-3198-1826266927?show_suggestion=0

1970

R. A. Lipshtejn, M. I. Shakhnovich, *The transformer oil, translated from Russian*, Ed 2.0 1968, Israel Program for Scientific Translations Jerusalem, 257 pages, 1970

<https://www.amazon.com/Transformer-revised-enlarged-Translated-Russian/dp/B074S4FRCG>

1975

A. Dymkov, *The transformer design*, Mir Publishers, Moscow, 324 pages, 1975

https://books.google.com.ua/books/about/Transformer_Design.html?id=X-UA6zQEACAAJ&redir_esc=y

1980

Z. Khudyakov, S. Kittell, *The repair of power transformers*, translated from 1977 Russian edition, Mir Publishers, Moscow, 333 pages, 1980

<https://www.amazon.com/Repair-Power-Transformers-Khudyakov-Kittell/dp/812390410X>

2013

A. K. Lokhanin, *Insulation problems of HV power transformers*, in the book *Transformers: Analysis, Design, and Measurement* by X. M. López-Fernández, H. Bülent Ertan, J. Turowski, CRC Press, 609 pages, 2013

https://books.google.com.ua/books/about/Transformers.html?id=XkyWt-gEACAAJ&redir_esc=y

2015

V. Ivankov, A. Basova, I. Khimiyuk, *Losses and heating of tank covers of large transformers. Theory, calculation, experiment*, LAP LAMBERT Academic Publishing, 96 pages, 2015

<https://www.morebooks.shop/store/gb/>

[book/losses-and-heatings-of-tank-covers-of-large-transformers/isbn/978-3-659-28296-6](https://books.google.com.ua/books/about/Transformers.html?id=XkyWt-gEACAAJ&redir_esc=y)

Design features and basic methods for reducing the general and local losses in the tanks of power transformers from concentrated magnetic fields of high current leads are given.

See a complete discussion of the issue in the book of the same authors: section B, 2017 (in Ukrainian).

Bibliography

[1] *Books on power transformers in Russian - A bibliography 1924 -2017* (Transformers Magazine issues: July 2021, October 2021, January 2022).

Authors



Vitaly Gurin graduated from Kharkov Polytechnic Institute (1962) and graduate school at the Leningrad Polytechnic Institute. Candidate of technical sciences in the Soviet scientific system (1970). For 30 years he tested transformers up to 1.150 kV at ZTZ, including the largest one of that time in Europe, and statistically analysed the test results. For over 25 years he was the Executive Director of Trafoservis Joint-Stock Company in Sofia (the diagnosis, repair and modernisation in the operating conditions of transformers 20 – 750 kV). He has authored about 150 publications in Russian and Bulgarian, and is the main co-author of GOST 21023.



P. Ramachandran started his career in transformer industry in 1966 at TELK, Kerala, a Hitachi Joint venture, in India. He worked with ABB India during 1999-2020. He has more than 50 years of experience in the design and engineering of power products including power transformers, bushings, and tap-changers. He received Bachelor of Science Degree in Electrical Engineering from the University of Kerala, India, and Master of Business Administration Degree from Cochin University, India. He is a Fellow of Institution of Engineers (India), and he represented India in CIGRE Study Committee A2 for transformers during 2002 – 2010.