



ABSTRACT

The bibliography of Russian books on power transformers and reactors is a continuation of the bibliography of books on power transformers in German published earlier. It was compiled at accessible Internet addresses for a period from 1924 (F. I. Kholuyanov, Single-phase, and three-phase transformers, 1924 - the first Russian book on transformers) until April 2020. The purpose of the compilation of published books is to give a historical resume on the topic, which may also be useful to other specialists in their research.

KEYWORDS

calculation, construction, design, historical development, GOST, power transformers, testing

Books on power transformers in Russian - A bibliography 1969 - 2017

1970

S. B. Vasyutinskij, *The theory and calculation issues of transformers* (Вопросы теории и расчета трансформаторов), LO Energy, Leningrad, 432 pages, 1970
<https://www.twirpx.com/file/776723/>

The theory of multi-winding transformers and autotransformers, calculation of reactance of transformer windings and complex transformer circuits and losses in them, electrodynamic forces, and thermal characteristics of transformers

By 1970s, transformer technology reached the mature stage in Russia, which is evident from the literature topics

are presented. The author is a representative of the Leningrad school of transformer specialists, forced to move to India.

For other books by the author, see 1960, 1976.

1971

Z. I. Khudyakov, *Design and repair of transformers* (Устройство и ремонт трансформаторов), Higher School, Moscow, 240 pages, 1971
<http://catalogue.nure.ua/document=95566>

1974

L. V. Leites, A. M. Pintsov, *Equivalent circuits for multi-winding transformers* (Схемы замещения многообмоточных

трансформаторов), Energy, Moscow, 192 pages, 1974

http://ruselprom-transformator.ru/files/Shemy_zameshcheniia_mnogoobmotочnyh_transformatorov_Leites_Pin-cov.pdf

Synthesis, analysis, and transformation of varieties of equivalent circuits that do not contain mutual inductances, considering and without considering the magnetizing current. Particularly considered are circuits whose elements correspond to certain areas of the structure and the magnetic field of the transformer. Examples are given - Yuri Shafir.

1976

S. A. Farbman, A. Y. Bun, I. M. Rajchlin, *Repair and modernization of trans-*

formers (Transformer Series, Vol. 29), Energy, Moscow, 192 pages, 1976

<http://padabum.com/d.php?id=220650>

S. B. Vasyutinsky, A. D. Krasilnikov, *Calculation and design of transformers, calculation of windings* (Расчет и проектирование трансформаторов, расчет обмоток), LPI, Leningrad, 84 pages, 1976

https://www.studmed.ru/vasyutinskiy-sb-raschet-i-proektirovanie-transformatorov-raschet-obmotok_3bcaadddf3f.html

1977

N. I. Bulgakov, *Transformer Connection Vector Groups* (Группы соединения трансформаторов), Ed. 3.0, Energy, Moscow, 80 pages, 1977

<http://www.e-reading-lib.com/book.php?book=133196>

Book entitled *Electromagnetic calculations of transformers and reactors*, published 40 years ago still remains relevant and one of a kind in the world practice

The following questions are described: how to get a given vector group in the connected windings of a three-phase transformer, how the connection group will change when the transformer terminals are re-marked in different ways, how to determine the group of the finished transformer. Instructions are given on the use of connection groups for three-winding transformers and auto-transformers.

V. P. Dubatov, *Production of power transformers up to 630 kVA (Transformer Series, Vol. 31)* (Производство трансформаторов мощностью до 630 кВА (Трансформаторы, вып. 31), Energy, Moscow, 112 pages, 1977
<http://padabum.com/d.php?id=220661>

1979

L. S. Gerasimova, I. A. Deynega, G. I. Pshenichnij, Y. Z. Chechelyuk, *Technology and production mechanization of power transformer winding and insulation (Transformer Series, Vol. 35)* (Технология и механизация производства обмоток и изоляции силовых трансформаторов (Трансформаторы, вып. 35)), Energy, Moscow, 336 pages, 1979
<http://padabum.com/d.php?id=207460>

Yu. S. Elkin, *Installation of electrical machines and transformers. The guide for installing personnel* (Монтаж электрических машин и трансформаторов. Справочник электромонтажника), Energy, Moscow, 200 pages, 1979
<https://www.elec.ru/library/info/mon-tazh-elektricheskikh-mashin/>

M. I. Rojzenman, G. V. Antonov, *Repair of transformer magnetic cores (Transformer Series, Vol. 34)* (Ремонт магнитопровода трансформаторов (Трансформаторы, вып. 34), Energy, Moscow, 200 pages, 1979
<http://padabum.com/d.php?id=222464>

1981

V. J. Filippishin, A. S. Tutkevich, *Installation of power transformers (Transformer Series, Vol. 38)*, (Монтаж силовых трансформаторов (Трансформаторы, вып. 38)), Energoizdat, Moscow, 432 pages, 1981
<http://padabum.com/d.php?id=220663>

Reflects the practices of Zaporizhzhya Transformer Plant as of 1980.

L. V. Leites, *Electromagnetic calculations of transformers and reactors* (Электромагнитные расчеты трансформаторов и реакторов), Energy, Moscow, 392 pages, 1981
[http://ruselprom-transformator.ru/files/Leites_Elektromagn_raschety_tr-rov_i_reaktorov_\(v_redakcii_2014_goda\).pdf](http://ruselprom-transformator.ru/files/Leites_Elektromagn_raschety_tr-rov_i_reaktorov_(v_redakcii_2014_goda).pdf)

The physical foundations of engineering methods for calculating the electromagnetic field, the main parameters, and energy losses in transformers, including methods for reducing losses, are considered. Particular attention is paid to issues of the surface effect, steel saturation,



non-sinusoidally of currents, and magnetic field. The methods of similarity, physical modeling, research, and testing are considered.

Forty years have passed, and the book remains relevant and one of a kind in the world practice - *Yuri Shafir*.

E. G. Minsker, V. S. Anshin, *Assembling of transformers* (Сборка трансформаторов), Ed. 5.0, Higher school, Moscow, 346 pages, 1981
http://bamper.info/492-minsker_e_g_anshin_v_s_sbornka_transformatorov_.html

1983

V. B. Atabekov, *Repair of transformers and electrical machines* (Ремонт трансформаторов и электрических машин), Higher School, Moscow, 352 pages, 1983
<http://booktech.ru/books/elek-trotehnika/236-remont-transformatorov-i-elektricheskikh-mashin-1983-vb-atabekov.html>

The book contains a description of the device transformers, electrical machines, and switching devices, as well as technology for electrical dismantling, repair, and assembly.

V. V. Bodnar, *The load capacity of oil-immersed power transformers (Transformer Series, Vol. 40)* (Нагрузочная способность силовых масляных трансформаторов (Трансформаторы, вып. 40), Energoatomizdat, Moscow, 176 pages, 1983
<http://padabum.com/d.php?id=222463>

The book outlines the load capacity of power oil transformers in various operating conditions, depending on the load mode, the temperature of the cooling medium, thermal parameters, and methods of cooling transformers. The technique of choosing the rated power of the transformer according to the conditions of systematic and emergency overloads is given.

1985

Y. A. Tsirel, V. S. Polyakov, *Operation of power transformers in power plants and*

A practical book from 1992 entitled *Current distribution in transformer windings* describes methods for calculating the current between parallel branches of windings, transposition patterns, typical errors, etc.

electrical networks, Energoatomizdat, Leningrad, 264 pages, 1985

https://books.google.hr/books/about/Ekspluatacija_silovyh_transformatorov_na.htm?id=2wHiNAAACAAJ&redir_esc=y

1986

Z. I. Khudyakov, *Transformer repair* (Ремонт трансформаторов), Ed. 6.0, Higher school, Moscow, 232 pages, 1986
<https://www.twirpx.com/file/2255226/>

1987

Y. B. Borodulin, V. A. Gusev, G. V. Popov, *Computer-aided design of power transformers* (Автоматизированное проектирование силовых трансформаторов), Energoatomizdat, Moscow, 264 pages, 1987
<https://www.twirpx.com/file/2666855/>

Computer-aided design systems for transformers 10-110 kV as of 1985

1990

A. I. Goncharuk, *Calculation and design of transformers* (Расчёт и конструирование трансформаторов), Energoatomizdat, Moscow, 256 pages, 1990
https://www.studmed.ru/goncharuk-ai-raschet-i-konstruirovaniye-transformatorov_bf78cccedb2.html

Examples of calculation of general-purpose power transformers and the necessary information are given. Intended for technical school students.

1991

V. S. Anshin, Z. I. Khudyakov, *Assembling of transformers* (Сборка трансформаторов), Ed. 2.0, Higher school, Moscow, 288 pages, 1991
https://www.studmed.ru/an-shin-vsh-hudyakov-zi-sborka-transformatorov_b7ad129281e.html

[shin-vsh-hudyakov-zi-sborka-transformatorov_b7ad129281e.html](https://www.studmed.ru/an-shin-vsh-hudyakov-zi-sborka-transformatorov_b7ad129281e.html)

The technological operations of assembling transformers of I-IV dimensions are described in detail. This textbook is intended for vocational schools.

1992

Y. N. Shafir, *Current distribution in transformer windings* (Распределение тока в обмотках трансформаторов), Energoatomizdat, Moscow, 192 pages, 1992
<https://search.rsl.ru/ru/record/01001651095>

The methods are given for calculation of the current distribution between parallel branches of transformer windings as well, including the cases of winding damages. The transposition patterns of branches are described, a technique for measuring the current distribution and typical errors is indicated. Almost 30 years have passed, and the book remains relevant and one of a kind in the world practice.

1993

Y. P. Shonin, *Overhaul of power transformers of 6-110 kV with change of windings* (*Transformer Series, Vol. 42*) (Капитальный ремонт со сменой обмоток силовых трансформаторов напряжением 6-110 кВ (Трансформаторы, вып. 42)), Energoatomizdat, Moscow, 96 pages, 1993
<http://padabum.com/d.php?id=222440>

2000

A. L. Vstovsky, S. A. Vstovsky, L. F. Silin, *Design of oil-immersed power transformer* (Проектирование силового масляного трансформатора), KSTU, Krasnoyarsk, 112 pages, 2000; IPC SFU, 116 pages, 2007; SFU, 120 pages, 2013
<http://padabum.com/d.php?id=173714>

2003

G. F. Bystritsky, B. I. Kudrin, *Selection and operation of power transformers* (Выбор и эксплуатация силовых трансформаторов), Academy, Moscow, 176 pages, 2003
<http://padabum.com/d.php?id=20696>

M. M. Katzman, *Electrical machines* (Электрические машины), Ed. 2.0, Higher school, Moscow, 463 pages, 2003
<http://padabum.com/d.php?id=31614>

The book examines the theory, principle of operation, device and analysis of the operating modes of electrical machines and transformers, both for general and special purposes, which have become widespread in various branches of technology.

2004

A. V. Ivanov-Smolensky, *Electrical machines, Vol. 1* (Электрические машины. Том 1), Ed. 2.0, MEI Publishing House, 656 pages, 2004
<https://www.twirpx.com/file/22696/>



Electrodynamic withstand of transformers and reactors during short circuits is a collection of articles by VEI employees, which has served as the basis for GOST 20243 standard

Electromechanical energy conversion in electrical machines and the principles of their design are considered. The main issues of the theory and design of transformers and asynchronous machines are stated. This is a high school textbook.

S. D. Lizunov, A. K. Lohanin, *Power transformers. Reference book* (Силовые трансформаторы. Справочная книга), Energoizdat, Moscow, 616 pages, 2004
https://www.studmed.ru/lizunov-sd-lohanin-ak-silovye-transformatory-spravochaya-kniga_3ce82453dc9.html

The book outlines the main practical issues of modern high-voltage transformers. The authors have prepared and systematized the material of the reference book based on their many years of experience and numerous publications in domestic and foreign periodicals. The book is intended for specialists in the field of electrical power equipment, engineering and technical workers of transformer plants, personnel of energy systems associated with the operation of transformers, and it can also be used as a guide for university students.



2006

G. N. Aleksandrov, *Transformer operating modes* (Режимы работы трансформаторов), Energy Training Center, St. Petersburg, 143 pages, 2006
https://www.studmed.ru/aleksandrov-gn-rezhimy-raboty-transformatorov_31eab187c20.html

This training manual is intended for specialists in the design and operation of high voltage transformers and auto-transformers. The characteristics of transformers and auto-transformers under normal and emergency conditions are considered. It is shown that the voltage fluctuations on the transformers are mainly due to the reactive component of the current in the line and that considering the saturation of the steel of the magnetic circuit in the transformers leads to an increase in the short-circuit current.

G. N. Alexandrov, M. A. Shakirov, *Transformers and reactors. New ideas and principles* (Трансформаторы и реакторы. Новые идеи и принципы), Publishing Polytechnic. University, St. Petersburg, 204 pages, 2006
<https://www.twirpx.com/file/1813756/>

The book presents new ideas on the theory of transformers and reactors. It is shown that a number of well-established ideas, including in the field of theoretical electrical engineering, require revision. The main material is presented in the form of articles as they are printed in relevant publications.

Electrodynamic withstand of transformers and reactors during short circuits (Электродинамическая стойкость трансформаторов и реакторов при коротких замыканиях), Compiled and edited by A. I. Lurie, Znak, Moscow, 520 pages, 2006
http://ruselprom-transformator.ru/files/Elektrodinamicheskaia_stoykost_trans-



[formatorov i reaktorov pri korotkom замыкании.pdf](#)

Collection of articles by VEI employees, which served as the basis for GOST 20243 and the new IEC section (methodology for the estimated assessment of transformer withstand during short circuits).

2009

G. Y. Schneider, *Electrical insulation of high voltage transformers* (Электрическая изоляция трансформаторов высокого напряжения), Znak, Moscow, 160 pages, 2009
<http://padabum.com/d.php?id=19918>

The book discusses issues related to the internal insulation of transformers and high voltage reactors - from 3 to 1150 kV, designed to work in electrical networks and in industry. The materials of the book are based on many years of experience in the design, testing, and research of insulation of transformers and reactors at the Moscow Electrozavod and at the All-Russian Electrotechnical Institute.

2013

M. A. Biki, *Design of power transformers. Calculation of the main parameters* (Проектирование силовых трансформаторов. Расчет основных параметров), Znak, Moscow, 612 pages, 2013
<https://www.twirpx.com/file/2062114/>

The book contains the basic information necessary for the calculation and design of power transformers: the principle of operation of transformers, types of transformers for the purpose, requirements for transformers, methods for calculating the main parameters.

2015

Power transformers: dielectric strength of internal insulation (Силовые трансформаторы: электрическая прочность внутренней изоляции), Ed. V. S. Larina, Sign, Moscow, 420 pages, 2015

<http://www.tvn-moscow.ru/forum/view-topic.php?f=50&t=3308>

The collection contains the results of research at VEI, Moscow, in the field of electrical strength of transformer insulation. Under the guidance of A. V. Panov, T. I. Morozova and A. K. Lohanin have created methodological support for the calculations and design of the internal insulation of transformer equipment, which has been tested and is presently widely used at the largest transformer plants in the CIS countries, China and India.

2017

V. F. Ivankov, A. V. Basova, I. V. Khimyuk, *The methods of transformer and reactor modelling* (Методи моделювання трансформаторів та реакторів), Institute of Electrodynamics of NAS of Ukraine, Kiev, 490 pages, 2017 (in Ukrainian)
http://www.ied.org.ua/files/monograf2_2017.pdf

The monograph considers analytical and numerical methods for calculating electromagnetic, thermal, and mechanical processes in power transformers and reactors. The developed methods are used in the design of power transformers and reactors at the Zaporizhzhya Transformer Plant.

Bibliography

[1] *Books on power transformers in German - A bibliography 1888 – 2019* (Transformers Magazine issues: October 2020, January 2021, April 2021)



Recently, very advanced topics have been addressed in Russian literature, which will ensure knowledge transfer to the younger generations of Russian language speaking engineers

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.