ABSTRACT

German literature on power transformers is covered from 1888 (first book on transformers published anywhere, just three years after patenting transformers), up to most recent publications issued in 2019. The purpose of the compilation of published books on power transformers is to give a historical summary on the topic, which may also be useful to other specialists in their research.

KEYWORDS

calculation, construction, design, DIN, historical development, power transformers, testing, VDE

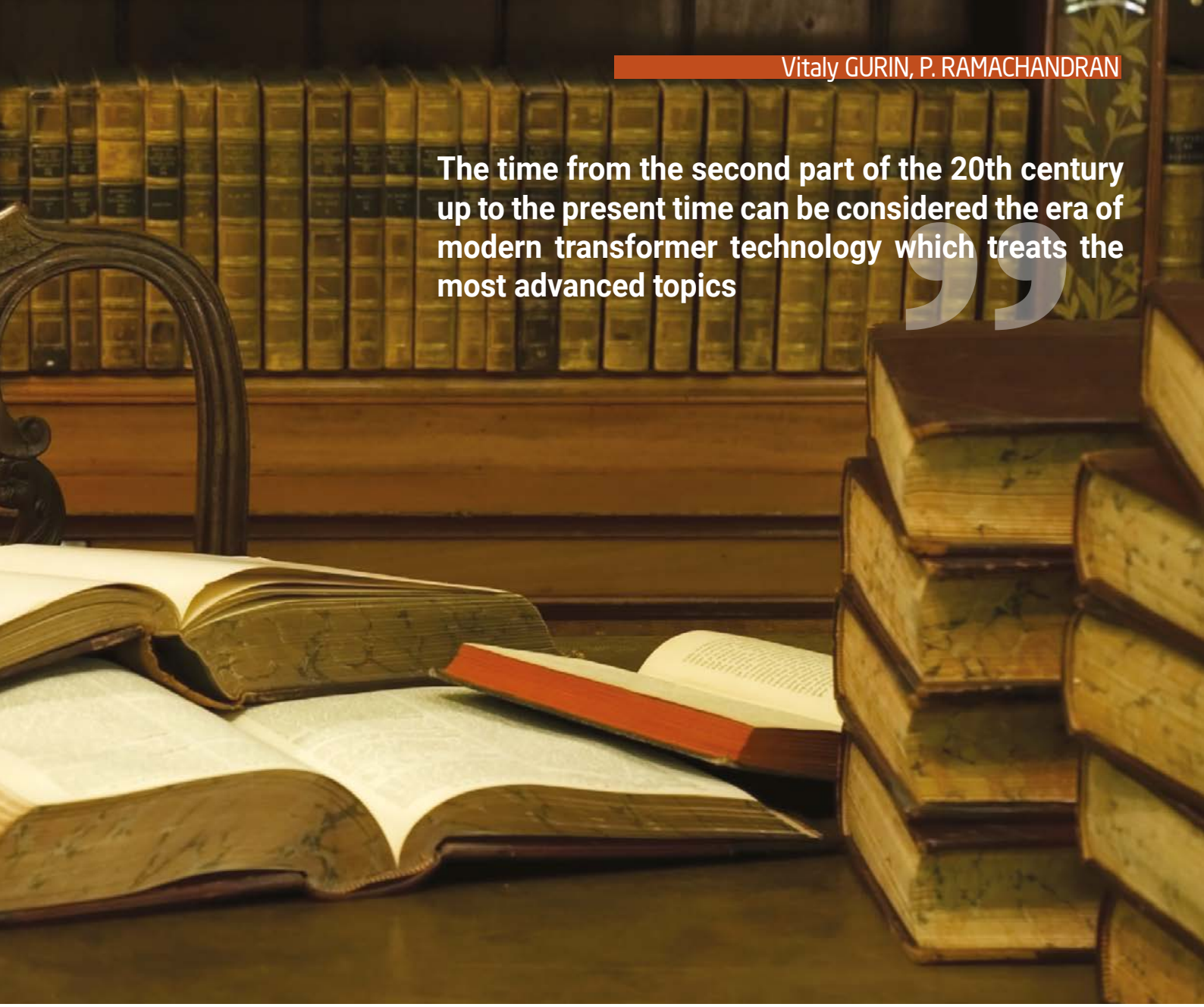
Books on power transformers in German – Part III

A bibliography 1952 – 2016

1952

Emil Pollak, *Umwickeln elektrischer Maschinen und Transformatoren* (Wrapping electrical machines and transformers), Verlag Österreichischer Gewerkschaftsbund, Wien, pages 112, 1952

Friedrich Weickert, *Krankheiten elektrischer Maschinen und Transformatoren* (Failure Analysis of electrical



The time from the second part of the 20th century up to the present time can be considered the era of modern transformer technology which treats the most advanced topics

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1954

F. Ande, *Betrieb und Anwendung von Leistungs- und Regeltransformatoren* (Operation and application of power and control transformers), Springer, Berlin, pages 332, 1954

1955

F. Unger, *Transformatoren* (Transformers), in books: E. V. Rziha, *Starkstromtechnik. Taschenbuch für Elektrotechniker, Band l* (Heavy current technology. Paperback for electrical engineers, Volume l), Ed. 8.0, Wilhelm Ernst & Sohn, Berlin, pp. 573–620, 1955

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Considered as the Bible of transformer engineering in the German speaking world. Understanding the theory and application of transformers is necessary for a successful career in the electrical field, specifically in industrial fields.

The book consists of the following sections: magnetic circuit, stray fluxes, short-circuit stresses, voltage stresses, load-bearing capacity, auto-transformers, tap-changers , cooling, design of the transformer, transformer noise.

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F. Ande, *Die Schaltung der Leistungstransformatoren* (The circuit of the power transformers), Springer, Berlin, pages 322, 1959

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E. Breitenbruch, *Transformatoren kleiner Leistung* (Low power transformers), Friedrich Vieweg & Sohn, Braunschweig, pages 212, 1960

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W. Baxmann, *Zur Theorie des Transformatorlärms magnetischen Ursprungs. Dissertation.* (The theory of transformer noise of magnetic origin. Dissertation.), TH Hannover, 1961

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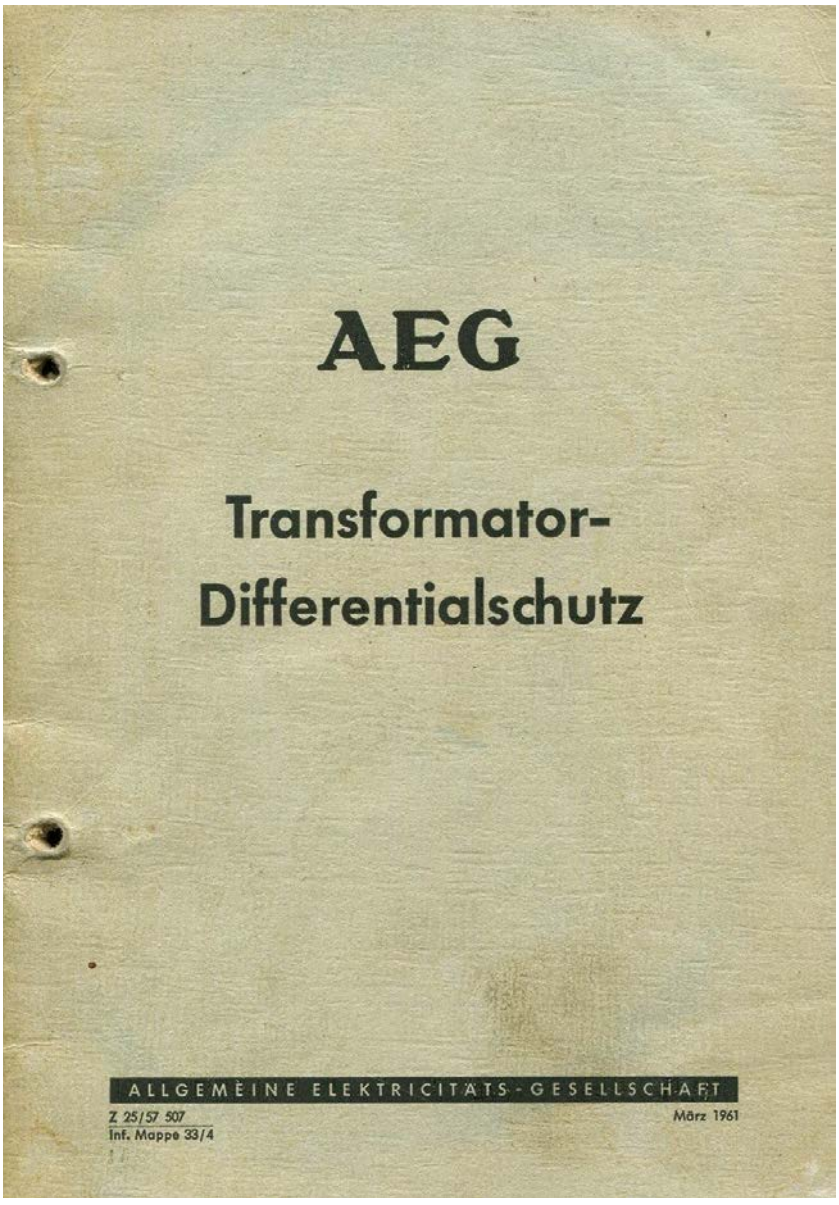
František Provazník, *Probleme der Transformatoren für höchste Spannung und Leistung* (Problems of high voltage, large capacity transformers), Publisher of the Czechoslovakia Academy of Sciences, Prague, pages144, 1961 [52]



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J. Reiser, *Elektrische Maschinen: I Grundlagen und Transformatoren (= Das Fachwissen des Ingenieurs)* (Electrical machines: I Basics and transformers (= The specialist knowledge of the engineer), Carl Hanser, pages 126, 1968

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Literature topics from the 1950s to 1980s shaped the modern technology of the transformers we know today

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Wilfried Weißgerber, *Elektrotechnik für Ingenieure 2:* Wechselstromtechnik, Ortskurven, Transformator, Mehrpasensysteme. Ein Leh- und Arbeitsbuch für das Grundstudium. (Electrical engineering for engineers 2: AC technology, locus curves, transformer, multi-phase systems. A teaching and workbook for basic studies.), Vieweg & Sohn, Braunschweig, 1991; Ed. 2.0, 1993; Ed. 3.0, 1996; Ed. 4.0, pages VIII + 372, 1999; Ed. 7.0, 2009; Ed. 8.0, 2012 [61, 62]

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Rudolf Janus, *Transformatoren* (Transformers), VDE-Verlag, Berlin, pages 188, 1993 [63]

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H. Vosen, *Kühlung und Belastbarkeit von Transformatoren: Erlauterungen zu DIN VDE 0532, VDE - Schriftenreihe Nr. 72* (Cooling and resilience of transformers: Explanations of DIN VDE 0532, VDE - series No. 72), VDE Verlag, pages 192, 1997

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Ebrahim Rahimpour, Hochfrequente Modellierung von Transformatoren zur Berechnung der Übertragungsfunktion (High frequency modeling of transformers to calculate the transfer function), Shaker Verlag, Stuttgart, pages 153, 2001 [64-66]

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Jochen Christian, *Erkennung mechanischer Wicklungsschäden in Transformatoren mit der Übertragungsfunktion* (Detection of mechanical winding damage in transformers using the transfer function), Shaker Verlag, pages 156, 2002 [67]

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Hermann J. Abts, *Verteil-Transformatoren / Distribution-Transformers*, Heidelberg Hüthig, pages 196, 2006; Ed. 2.0, VDE Verlag, Berlin, pages 206, 2017 (bilingual book)

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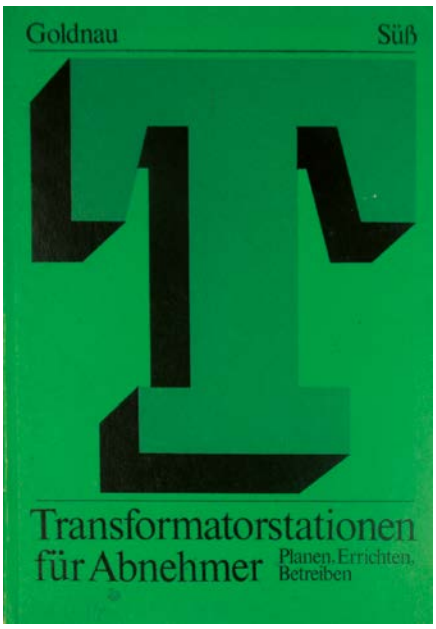

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Ulrich Wagner, *Elektrische Kraftwerkstechnik 1: Generatoren, Transformatoren, Eigenbedarfsanlagen, Schutzeinrichtungen; Vorlesungsskript* (Electrical power plant technology 1: Generators, transformers, own requirements, protective devices; Lecture script), Ed. 5.0, Technical University of Munich, pages 177, 2009 [71]

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Peter Baier, *Dreiphasen-Leistungstransformatoren - Magnetisierungserscheinungen, Harmonische, Betriebsvorgänge, Stell- und Stromrichtertransformatoren* (Three-phase power transformers - magnetisation phenomena, harmonics, operations, actuators and converter transformers), VDE Verlag, Berlin, Pages 204, 2010 [72, 73]

2011

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2014

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Leonhard Stiny, *Elektrotechnik für Studierende: Wechselstrom 2 - Ortskurven, Mehrphasensysteme, Transformatoren und Übertrager - Band 4* (Electrical engineering for students: AC 2 - locus, multiphase systems, transformers and heat exchangers - Volume 4), Verlag Christiani, pages 256, 2014 [76]

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Frank Zinecker, *Optimierung eines Tesla-Transformators - Methoden und Anwendungen* (Optimisation of a Tesla transformer - methods and applications), AV Akademikerverlag, pages 56, 2016 [78, 79]

Conclusion

While working on the bibliography, the authors tried to compile a historical summary of the published books on power transformers in German language and did not pursue commercial goals. They hope that the bibliography will be useful to other specialists in their research, and also may create awareness among new-generation engineers of the path we have travelled so far.

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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.