
Editorial

Dear Readers,

It is a great pleasure for me to introduce this special issue “14th International Fluid Power Conference”. This special issue presents six fascinating contributions, which were originally presented at the International Fluid Power Conference (IFK) in March 2024 in Dresden and have been revised and expanded by their authors with their newest research results.

The IFK is one of the world’s most significant scientific conferences on Fluid-Mechatronic Systems, which offers a common platform for the presentation and discussion of trends and innovations to manufacturers, users and scientists. The Chair of Fluid-Mechatronic Systems (LFD) at the TU Dresden was organising and hosting the IFK for the seventh time. The organization and the conference location alternates every two years between Dresden at the LFD and Aachen at the Institute for Fluid Power Drives and Systems (ifas). The 14th IFK covered under the motto “Fluid Power: Sustainable Productivity” a wide range of topics from component developments like pumps or valves towards system applications for mobile, industrial or pneumatic applications in 91 peer-reviewed and non-peer-reviewed presentations, respectively papers. Due to this almost unmanageable number of exciting contributions, it is a great pleasure for me to present this special issue, which represents a small and finely sorted selection of particularly promising and high rated contributions of the IFK.

However, the following six articles are not simply reprints of the conference publications, but the authors have taken the trouble to thoroughly revise their contributions and enrich them with new research results for this special issue, for which I am very grateful. The contributions deal with very different research objects, e.g. lubrications, solenoids, axial piston pumps and hydraulic system-layouts for mobile machines, but they focus especially on two important aspects, namely energy efficiency and digitalization. Improving the energy efficiency by using new technologies or through improved

designs based on new simulation methods will not only reduce costs, but also help us to make the hydraulics industry more sustainable. Furthermore, enhancing available information on the current condition of hydraulic components or systems will prepare fluid power systems for the future demands of industrial digitalization. I hope the reader may benefit from these insights and this special issue will encourage you, to contribute your own results to future International Fluid Power Conferences.

Finally, I would like to thank all those who have contributed to the creation of this special issue, which is being published for the first time in cooperation with the International Journal of Fluid Power. In particular, I would like to emphasise the support of the guest editors in the review process and I hope you enjoy reading this special issue.



Prof. Dr.-Ing. Jürgen Weber



Jürgen Weber had studied mechanical engineering at Dresden University of Technology, and successfully finished his doctorate in 1991. Until 1997, he was the active senior engineer at the former chair of Hydraulics and Pneumatics. This was followed by an approximately 13-year industrial phase. He was active in various positions at the R&D department of the agricultural and construction machinery manufacturer CNH. Besides his occupation as the head of the Department Hydraulics and design manager for mobile and tracked excavators, starting in 2002, he took on responsibility for the hydraulics in construction machinery at CNH worldwide. From 2006 onward, he was the global head of architecture for hydraulic drive and control systems, system integration and advance development of CNH construction machinery. March

1st, 2010, Dr.-Ing. Jürgen Weber has been appointed university professor and chair of Fluid-Mechatronic System Technology at Dresden University of Technology, and simultaneously took on the leadership of the Institute of Fluid Power. Since 1.7.2018 he is the leader of the Institute of Mechatronic Engineering.

Guest Editors:

Dr.-Ing. Martin Petzold, Department Manager at Bosch Rexroth, 2015 PhD at Dresden University of Technology

Dr.-Ing. Georg Schoppel, Department Manager at Bosch Rexroth, 2004 PhD at Friedrich-Alexander-Universität Erlangen-Nürnberg

Dr.-Ing. Ralf Tautenhahn, Development Engineer at Thomas Magnete, 2020 PhD at Dresden University of Technology

