Vacuum Electronics

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(Eds.)

Vacuum Electronics

Components and Devices

With 388 Figures

Springer

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Preface

In 1989 the "Handbuch der Vakuumelektronik" (Handbook of Vacuum Electronics) was published in the R. Oldenbourg Verlag, München, Wien, edited by J. Eichmeier and H. Heynisch. During the past 18 years considerable progress has been achieved in the fields of vacuum electronic components, systems and procedures. In the present book a group of 36 well-known experts from industry, scientific institutes and universities report about the fundamentals, state-of-the-art, recent developments and their own experiences in all important areas of Vacuum Electronics.

The operation of vacuum electronic components and devices is based on the motion of electrons or ions under the influence of electric, magnetic or electromagnetic fields. Presently, research activities are concentrated on microwave tubes, especially travelling wave tubes, klystrons, gyrotrons and cross-field devices; switching tubes and vacuum relays; photomultipliers, image converter and image amplifier tubes; vacuum and plasma panel displays; electron and ion beam systems; particle accelerators; electron and ion microscopes; ion and plasma propulsion systems; light sources and gas lasers; X-ray tubes; gas discharge systems; vacuum electronic systems for semiconductor technology; and finally, vacuum technology and vacuum measuring techniques.

Vacuum electronic components, systems and procedures are applied in information, measuring and control engineering and also in high frequency, nuclear, plasma and biomedical engineering. This book presents the current state-of-the-art of vacuum electronics in research, development and production. Its reader should have a basic knowledge of electronics, especially the principles of vacuum electronics. It may be a useful source of proper information for students of electrical engineering and physics and also for engineers and physicists who develop or apply vacuum electronic components and devices in a variety of technological fields. The literature cited is the most appropriate for further reading. All the chapters begin with a historical note, and the references credit the scientists and engineers who were responsible for major breakthroughs and advancements in the various fields of vacuum electronics.

On behalf of all co-authors, the editors thank Springer-Verlag, Berlin, Heidelberg, New York, for the careful lay-out and printing of this book. The editors thank all co-authors for their excellent contributions.

Munich, Karlsruhe *J.A. Eichmeier*
January 2008 *M.K. Thumm*

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