

INDUSTRIAL PROCESS CONTROL, S. G. Lloyd and G. D. Anderson, Fisher Controls Company, 1971, 272 pp.

REVIEWED BY RICHARD C. WINFREY¹

As implied by the title and the name of the publisher, this book gives a strong emphasis to the practical coverage of pneumatic control components and systems. The authors seem well qualified to write about pneumatic controls. Many injections of "rules of thumb" into descriptions of design trade-offs and component selection will be of great value to present-day, as well as aspiring, control system designers. The book is copiously illustrated with charts, diagrams, and detailed drawings of hardware, and although the emphasis is on pneumatics, numerous practical examples are given of mechanical, electromechanical, and hydraulic components. The homework problems provided for each chapter tend strongly towards practical situations encountered in engineering, and quite a few problems give tables of typical values for the operating parameters of the system under study.

The first part of the book gives a brief but thorough review of most of what can be properly taught in a first course on automatic controls. Included in this review are methods for the solution of linear differential equations, Laplace transforms, the concept and some consequences of feedback, block diagram algebra, and prediction of stability. Methods of stability include those of Nyquist, Bode, and of root locus. However, the majority of the book relies mainly on Bode diagrams and Nichols charts for predicting system stability and performance.

The second part of the book is directed more toward hardware, and here the emphasis is almost solely on pneumatics. A variety of components are discussed with regard to how the components work, what their limitations are, what their transfer functions are, and how they are tested. Linerization is also dealt with at the same time that transfer functions are derived.

The last part of the book deals with system analysis and simulation. It is shown how the earlier material of the book can be combined in predicting the performance of larger processes. The analysis of nonlinear systems by the describing function method is briefly given followed by a review of analog computers

with examples of their application to linear and nonlinear system simulation.

Industrial Process Control would be an excellent text for a second course in automatic controls. Ample review of the fundamentals is followed by a thorough treatment of practical pneumatic control theory and design. It can well be used as a reference on all aspects of practical pneumatic control design.

PRACTICAL INSTRUMENTATION TRANSDUCERS, Frank J. Oliver, Hayden Book Co. Inc., New York 1971, 340 pp.

REVIEWED BY P. W. RODGERS¹

IN this interesting book the author has successfully encompassed the entire range of instrumentation transducers. In many respects it is similar to the Air Force's *Telemetry Transducer Handbook* but is much more complete and up to date. The book is directed to instrumentation and control engineers and treats virtually every known transducer of physical variable to electrical output. The author has even included some excellent chapters on the problems of low level signals and interference in transducer channels.

The material in the text is arranged so that each chapter treats all the transducers used to measure a particular physical variable. The breadth of the material covered is indicated by following abbreviated listing of chapters by topic: strain, force, load, torque; linear displacement and thickness; angular position; rotary speed; vibration and shock; acceleration; pressure; temperature; radiation; moisture, humidity and dewpoint; flow; liquid and dry bulk level. The principle of operation of each transducer is carefully explained and its use treated in detail even to the extent of discussing calibration procedures. The advantages and disadvantages of each transducer are discussed. Many references are given at the end of each chapter.

Since I have had this book I have had occasion to use it many times; it has always proved most useful. In short I can strongly recommend this book to anyone dealing with transducers. It is certain to be one of their primary references.

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