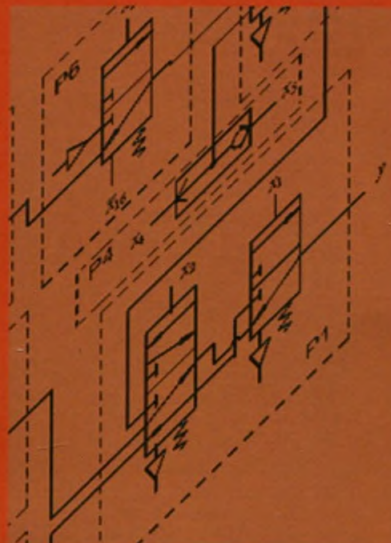


62-525
S70

Ye. Sokol, M. Cherkashenko

Synthesis of control schemes of drives systems



Ye. Sokol, M. Cherkashenko

Synthesis of control schemes of drives systems

Textbook

NTU “KhPI” 2018

CH-48
UDC 62-82.001.2

CH-48 Sokol Ye., Cherkashenko M. Synthesis of control schemes of drives systems.- Kh.: NTU “KhPI”, 2018.- 120 p. ISBN 978-617-7634-35-4

Methods of synthesis of schemes for system of drives is submitted. The positional structure is presented, its minimization allows to obtain a minimal graph of operations, minimal control systems of drives, and consequently minimal schemes, while preserving the positive properties of the standard positional structure. A synthesis of the schemes is provided, including methods of separate and undivided decomposition of the equations, leading to the minimal schemes by the number of elements.

The textbook is intended for students and graduate students of machine-building professions

Reviewer: A. Rusanov, Corresponding Member of the NAS of Ukraine, Prof., Dr.Sc., Director of IPMach NAS of Ukraine

ISBN 978-617-7634-35-4

© Ye. Sokol, M. Cherkashenko 2018

CONTENT

Introduction.....	4
Chapter 1 Synthesis of control systems.....	5
1.1. Methods for synthesis of control systems.....	5
1.2. Control systems description using graphs operations.....	9
1.3. Standard positional structure.....	10
1.4. Methods of minimizing the total standard position structure.....	11
1.4.1. Synthesis minimal graph operations.....	15
1.4.2. Synthesis of logical equations of hydropneumatic units switching devices with two-way control.....	18
1.4.3. Accounting for multiple programs of work of hydropneumatic units.....	27
1.4.4. Method of reducing the number of equations.....	29
1.4.5. Operating modes of systems of hydropneumatic units.....	34
1.5. Synthesis of positional hydropneumatic schemes using equations decomposition method undivided.....	41
1.6. Discrete-analog systems control.....	45
1.7. Machine simulation of synthesis of systems and schemes.....	53
1.8. Exercises for independent decisions to chapter 1.....	64
Chapter 2 Synthesis of schemes.....	69
2.1. Mathematical description of the model of schemes hydropneumatic	69
2.1.1. Undivided decomposition methods.....	69
2.1.2. Synthesis of schemes in symbiosis of separate and decomposition undivided.....	75
2.1.3. Synthesis of schemes of ultra-universal logical units.....	88
2.1.4. Exercises for independent decisions to chapter 2.....	93
Chapter 3 Creation of software and hardware complexes.....	95
3.1. Programmable microprocessor controllers.....	95
3.2. Software of programmable controllers.....	96
3.3. Creation of software and hardware for complex test bench of pumps.....	101
3.4. Exercises for independent decisions to chapter 3.....	117
Bibliography.....	119