

## <<控制系统技术概论>>

### 图书基本信息

书名：<<控制系统技术概论>>

13位ISBN编号：9787111187097

10位ISBN编号：7111187091

出版时间：2006-4

出版时间：机械工业出版社

作者：贝特森

页数：704

版权说明：本站所提供下载的PDF图书仅提供预览和简介，请支持正版图书。

更多资源请访问：<http://www.tushu007.com>

## &lt;&lt;控制系统技术概论&gt;&gt;

## 内容概要

《控制系统技术概论（英文版·原书第7版）》的作者有长达10年的控制工程技术工作经历，加之非常明确的编著目的——培养学生掌握闭环控制系统构建、控制器设计、系统现场调试等方面的技术与方法，使本书具有理论联系实际、工程背景强的基本特色和鲜明特点。

1.总体结构独特，突出工程实践； 全书正文由五部分组成，思路开阔，内容由浅入深，层次分明，系统性强。

第一部分“引论”共四章，占全书除附录外的23.3%篇幅，这在其他同类书籍中较为少见，有利于初学者对自动控制的概念、闭环系统的基本组成与常用部件、系统类型、控制的目的与评价标准等有一个全面、清晰的认识。

2.内容融合多门课程，结合技术标准； 本书以闭环控制系统的分析、设计为主线，涉及的被控对象包括电系统、气动系统、液压系统、热力系统、机械系统等，将自动控制理论、自动检测技术、自动检测技术、电机气动基础、电力电子技术、过程控制系统、运动控制系统、电气控制与PLC等多门课程融合在一起，形成一个有机的整体。

3.论述深度把握合理，采用启发性方式叙述； 书中每章前都列出该章学习目的和需要重点掌握的内容，便于读者目标明确地学习，并自我衡量是否达到本章学习要求。

全书的16章中有14章都引论。

引论的内容起到如下几个作用： 概括全章的内容； 承上启下，提出问题，以便在此后的各节中逐一解决； 阐明重要要领。

4.插图强调联系实际，习题侧重工程训练。

全书的插图经过精心设计，直观、清晰，有助于概念的理解。

书中有相当数量的工程图，如气动控制阀的机械结构图、工业传送带控制系统电气控制原理图等等，体现了与工程紧密联系的特点。

一插图配有较大篇幅的文明说明，一方面方便了读者，另一方面使正文的文字简练。

<<控制系统技术概论>>

作者简介

作者：(美)罗伯特 N.贝特森

<<控制系统技术概论>>

书籍目录

Preface	PART ONE INTRODUCTION		CHAPTER I Basic Concepts and Terminology	1.1
Introduction	1.2	Block Diagrams and Transfer Functions	1.3	Open-Loop Control
1.4	Closed-Loop Control: Feedback		1.5	Control System Drawings
1.7	Benefits of Automatic Control		1.6	Nonlinearities
1.11	Criteria of Good Control		1.8	Load Changes
Control	2.1	Introduction	1.9	Damping and Instability
Follow-Up Systems	2.4	Process Control	CHAPTER 2	Types of
Control	2.7	Numerical Control	2.2	Analog and Digital Control
	2.9	The Evolution of Control Systems	2.3	Regulator and
			2.5	Servomechanisms
			2.8	Robotics
				Contents
			2.10	Examples of Control Systems
	CHAPTER 3		The Common Elements of System Components	
3.3	Liquid Flow Elements		3.1	Introduction
Mechanical Elements	3.4	Gas Flow Elements	3.2	Electrical Elements
CHAPTER 4	Laplace Transforms and Transfer Functions		3.5	Thermal Elements
4.2	Input/Output Relationships		3.6	
4.5	Transfer Functions		4.1	Introduction
Plots	4.3	Laplace Transforms	4.4	Inverse Laplace Transforms
PART TWO	MEASUREMENT		4.7	Frequency Response: Bode
Introduction	5.2	Statistics	CHAPTER 5	Measuring Instrument Characteristics
5.5	Dynamic Characteristics		5.1	
Introduction	5.3	Operating Characteristics	5.4	Static Characteristics
Conditioning	5.6	Selection Criteria	CHAPTER 6	Signal Conditioning
7.1	Introduction		6.2	The Operational Amplifier
Measurement	6.3	Op-Amp Circuits	6.3	Op-Amp Circuits
Variable Sensors	6.5	Digital Signaling Conditioning	6.4	Analog Signal
Pressure Measurement	7.2	Position and Displacement Measurement	6.5	Digital Signaling Conditioning
Switches, Actuators, Valves, and Heaters	7.4	Acceleration Measurement	CHAPTER 7	Position, Motion, and Force Sensors
Solid-State Components	7.5	Force Measurement	7.1	Introduction
Valves	8.1	Temperature Measurement	7.2	Position and Displacement Measurement
10.2	AC Motors		7.3	Velocity
Drives	8.2	Flow Rate Measurement	7.4	Acceleration Measurement
Processes	8.4	Liquid Level Measurement	7.5	Force Measurement
Event-Driven Sequential Processes	PART THREE		CHAPTER 8	Process
Programmable Logic Controllers	MANIPULATION		8.1	Temperature Measurement
Functions	9.1	Mechanical Switching Components	8.2	Flow Rate Measurement
CHAPTER 13	Control of Continuous Processes		8.3	Pressure Measurement
Control	9.3	Hydraulic and Pneumatic Valves and Actuators	8.4	Liquid Level Measurement
Control	9.5	Electric Heating Elements	CHAPTER 9	Switches, Actuators, Valves, and Heaters
Characteristics	CHAPTER 10		9.1	Mechanical Switching Components
14.1	Introduction		9.2	
14.4	The Second-Order Lag Process		9.3	Hydraulic and Pneumatic Valves and Actuators
14.6	The First-Order Lag Plus Dead-Time Process		9.4	Control
Introduction	10.2	AC Motors	9.5	Electric Heating Elements
Diagrams	10.3	DC Motors	CHAPTER 10	Electric Motors
Computer-Aided Bode Plots	10.4	Stepping Motors	10.1	Introduction
Stability Criterion	10.5	AC Adjustable-Speed	10.2	AC Motors
Adaptive Controllers	10.6	DC Motor Amplifiers and Drives	10.3	DC Motors
Three-Loop Control System	PART FOUR		10.4	Stepping Motors
	CONTR		10.5	AC Adjustable-Speed
	CHAPTER 11		10.6	DC Motor Amplifiers and Drives
	Control of Discrete		PART FIVE	
	Processes		ANALYSIS AND DESIGN	
	11.1		CHAPTER 14	
	Introduction		Process	
	11.2		Characteristics	
	Time-Driven Sequential Processes		14.1	
	11.4		Introduction	
	Time/Event-Driven Sequential Processes		14.2	
	12.1		The Integral or Ramp Process	
	Introduction		14.3	
	12.2		The Dead-Time Process	
	PLC Hardware		14.4	
	Contents		The First-Order Lag Plus Dead-Time Process	
	12.3		CHAPTER 15	
	PLC Programming and Operation		Methods of Analysis	
	12.4		15.1	
	PLC Programming		Introduction	
	CHAPTER 13		15.2	
	Control of Continuous Processes		Overall Bode Diagram of Several Components	
	13.1		15.3	
	Introduction		Open-Loop Bode	
	13.2		Diagrams	
	Modes of		15.4	
	Control		Closed-Loop Bode Diagrams	
	13.3		15.5	
	Electronic Analog Controllers		Error Ratio and Deviation Ratio	
	13.4		15.6	
	Digital Controllers		Computer-Aided Bode Plots	
	13.5		15.7	
	Advanced		Stability	
	Control		15.8	
	13.6		Gain and Phase Margin	
	Fuzzy Logic Controllers		15.9	
	PART FIVE		Nyquist	
	ANALYSIS AND DESIGN		Stability Criterion	
	CHAPTER 14		15.10	
	Process		Root Locus	
	14.1		CHAPTER 16	
	Introduction		Controller Design	
	14.2		16.1	
	The Integral or Ramp Process		Introduction	
	14.3		16.2	
	The Dead-Time Process		The Ultimate Cycle Method	
	14.4		16.3	
	The Second-Order Lag Process		The Process Reaction Method	
	14.5		16.4	
	The First-Order Lag Plus Dead-Time Process		Self-Tuning	
	CHAPTER 15		16.5	
	Methods of Analysis		Computer-Aided PID Controller Design	
	15.1		16.6	
	Introduction		Example Design of a	
	15.2		Three-Loop Control System	
	Overall Bode Diagram of Several Components		16.7	
	15.3		Control System Compensation	
	Open-Loop Bode		Contents	
	Diagrams		APPENDIX A	
	15.4		Properties at	
	Closed-Loop Bode Diagrams			
	15.5			
	Error Ratio and Deviation Ratio			
	15.6			
	Computer-Aided Bode Plots			
	15.7			
	Stability			
	15.8			
	Gain and Phase Margin			
	15.9			
	Nyquist			
	Stability Criterion			
	15.10			
	Root Locus			
	CHAPTER 16			
	Controller Design			
	16.1			
	Introduction			
	16.2			
	The Ultimate Cycle Method			
	16.3			
	The Process Reaction Method			
	16.4			
	Self-Tuning			
	16.5			
	Computer-Aided PID Controller Design			
	16.6			
	Example Design of a			
	Three-Loop Control System			
	16.7			
	Control System Compensation			
	Contents			
	APPENDIX A			
	Properties at			

<<控制系统技术概论>>

Materials	Properties of Solids	Melting Point and Latent Heat of Fusion	Properties of	
Liquids	Properties of Gases	Standard Atmospheric Conditions	APPENDIX B Units and	
Conversion	Systems of Units	Conversion Factors	APPENDIX C Binary Codes	Powers
of 2	Octal and Binary Equivalents	Decimal, Hexadecimal, and Binary Equivalents	One's	
and Two's Complements	The Gray Code	Binary Codes for Decimal Digits	Seven-Bit	
ASCII Code	APPENDIX D Instrumentation Symbols and Identification	Purpose	Scope	
Definition	Outline of the Identification System	APPENDIX E Complex Numbers	Introduction	
	Rectangular and Polar Forms of Complex Numbers	Conversion of Complex Numbers		
Graphical Representation of Complex Numbers		Addition and Subtraction of Complex Numbers		
Multiplication and Division of Complex Numbers		Integer Power of a Complex Number	Roots	
of a Complex Number	APPENDIX F Communications	Communication Interfaces	Local Area	
Networks	Communication Protocols			

<<控制系统技术概论>>

版权说明

本站所提供下载的PDF图书仅提供预览和简介，请支持正版图书。

更多资源请访问:<http://www.tushu007.com>