

# 《过程控制仪表技术》

## 图书基本信息

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## 前言

由Curtis D. Johnson教授（University of Houston）编著的《过程控制仪表技术》一书自出版以来受到广泛的欢迎，目前该书已出到第8版，其中添加了许多自动化领域新技术发展的内容，实现了与最新科技发展同步的目标。全书共分为两部分，第一部分为前6章，作者从人们对生产设备手动操作的实际经验出发，系统地介绍了控制原理、控制设备和控制系统的基本概念。在测量信号的变换和处理方面，把工业仪表中的模拟电路、可编程控制器（PLC）及信号采集系统中的数字电路结合工业电子学中的基本理论融会贯通加以介绍。在测量信号的获取方面，重点对温度、机械量和光学传感器的原理、器件、特性和应用进行了详细的分析。书中第二部分为后6章，首先讲述了控制信号的类型和执行器，接着重点介绍了离散、连续、计算机及总线网络控制系统的构成、特点和技术指标。结合系统的要求，讲解了PLC的原理和编程方法，位式控制、PID概念及模拟调节器，工业控制计算机硬件、软件的配置等内容。最后介绍了串级和多变量控制系统以及系统的调节质量评定和调节参数的整定方法。尽管涉及工业测量和调节控制内容的同类教材很多，但这本书有它自己的特点：（1）测量技术和控制技术相结合。把工业电子学的知识和工业仪表中的模拟电路、信号采集系统中的数字电路相结合；把被控系统的特性和调节器的功能相结合。这样就为控制系统中的装置与系统、理论与实际相结合打下了基础，克服了目前我国自动化专业教育中理论、系统、装置、应用互相分割的状况。（2）例题习题非常丰富。书中每章结束都有习题，而且在每个章节中还附有大量的例题。这些例题和习题都是围绕核心概念，结合实际应用的典型问题，通过解题可以使读者加深对基础理论的理解，学会设计和调试的方法，扩展应用的思路。

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## 内容概要

《过程控制仪表技术(第8版)》共分为两部分，第一部分为前6章，作者从人们对生产设备手动操作的实际经验出发，系统地介绍了控制原理、控制设备和控制系统的基本概念。在测量信号的变换和处理方面，把工业仪表中的模拟电路、可编程控制器（PLC）及信号采集系统中的数字电路结合工业电子学中的基本理论融会贯通加以介绍。在测量信号的获取方面，重点对温度、机械量和光学传感器的原理、器件、特性和应用进行了详细的分析。书中第二部分为后6章，首先讲述了控制信号的类型和执行器，接着重点介绍了离散、连续、计算机及总线网络控制系统的构成、特点和技术指标。结合系统的要求，讲解了PLC的原理和编程方法，位式控制、PID概念及模拟调节器，工业控制计算机硬件、软件的配置等内容。最后介绍了串级和多变量控制系统以及系统的调节质量评定和调节参数的整定方法。

# 《过程控制仪表技术》

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# 《过程控制仪表技术》

## 书籍目录

1 INTRODUCTION TO PROCESS CONTROL	1
1.1 Instructional Objectives	1
1.2 Introduction	1
1.3 Control Systems	2
1.4 Process-Control Block Diagram	6
1.5 Control System Evaluation	10
1.6 Regulation	1
1.7 Evaluation Criteria	1.4.4
1.8 Analog and Digital Processing	14
1.9 Units, Standards, And Definitions	22
1.10 Sensor Time Response	36
1.11 Significance and Statistics	40
Summary   Problems   Supplementary Problems	
2 ANALOG SIGNAL CONDITIONING	53
2.1 Instructional Objectives	53
2.2 Introduction	53
2.3 Principles of Analog Signal Conditioning	54
2.4 Passive Circuits	58
2.5 Operational Amplifiers	83
2.6 OP Amp Circuits in instrumentation	89
2.7 Design Guidelines	102
Summary   Problems   Supplementary Problems	
3 DIGITAL SIGNAL CONDITIONING	115
3.1 Instructional Objectives	115
3.2 Introduction	115
3.3 Review of Digital Fundamentals	116
3.4 Converters	125
3.5 Data-Acquisition Systems	155
3.6 Characteristics of Digital Data	160
Summary   Problems   Supplementary Problems	
4 THERMAL SENSORS	175
4.1 Instructional Objectives	175
4.2 Introduction	175
4.3 Definition of Temperature	176
4.4 Metal Resistance versus Temperature Devices	180
4.5 Thermistors	189
4.6 Thermocouples	193
4.7 Other Thermal Sensors	204
4.8 Design Considerations	211
Summary   Problems   Supplementary Problems	
5 MECHANICAL SENSORS	223
5.1 Instructional Objectives	223
5.2 Introduction	223
5.3 Displacement, Location, or Position Sensors	224
5.4 Strain Sensors	232
5.5 Motion Sensors	246
5.6 Pressure Sensors	258
5.7 Flow Sensors	267
Summary   Problems   Supplementary Problems	
6 OPTICAL SENSORS	285
6.1 Instructional Objectives	285
6.2 Introduction	285
6.3 Fundamentals of EM Radiation	286
6.4 Photodetectors	296
6.5 Pyrometry	311
6.6 Optical Sources	316
6.7 Applications	322
Summary   Problems   Supplementary Problems	
7 FINAL CONTROL	333
7.1 Introduction	333
7.2 Final Control Operation	334
7.3 Signal Conversions	336
7.4 Power Electronics	342
7.5 Actuators	358
7.6 Control Elements	371
summary   Problems   Supplementary Problems	
8 DISCRETE-STATE PROCESS CONTROL	387
8.1 Introduction	387
8.2 Definition of Discrete-State Process Control	388
8.3 Characteristics of the System	389
8.4 Relay Controllers and Ladder Diagrams	403
8.5 Programmable Logic Controllers (PLCs)	413
summary   Problems   Supplementary Problems	
9 CONTROLLER PRINCIPLES	439
9.1 Introduction	439
9.2 Process Characteristics	440
9.3 Control System Parameters	442
9.4 Discontinuous Controller Modes	448
9.5 Continuous Controller Modes	457
9.6 Composite Control Modes	466
Summary   Problems   Supplementary Problems	
10 ANALOG CONTROLLERS	481
10.1 Introduction	481
10.2 General Features	482
10.3 Electronic Controllers	483
10.4 Pneumatic Controllers	500
10.5 Design Considerations	504
summary   Problems   Supplementary Problems	
11 COMPUTER-BASED CONTROL	513
11.1 Introduction	513
11.2 Digital Applications	514
11.3 Computer-Based Controller	519
11.4 Other Computer Applications	533
11.5 Control System Networks	540
11.6 Computer Controller Examples	550
summary   Problems   Supplementary Problems	
12 CONTROL-LOOP CHARACTERISTICS	559
12.1 Introduction	559
12.2 Control System Configurations	560
12.3 Multivariable Control Systems	564
12.4 Control System Quality	568
12.5 Stability	575
12.6 Process-Loop Tuning	580
summary   Problems   Supplementary Problems	
APPENDICES	599
REFERENCES	636
GLOSSARY	637
SOLUTIONS TO THE ODD-NUMBERED PROBLEMS	641
SOLUTIONS TO THE ODD-NUMBERED PROBLEMS	641
INDEX	687

## 章节摘录

**插图：1.3.1 Identification of Elements** The elements of a process-control system are defined in terms of separate functional parts of the system. The following paragraphs define the basic elements of a process-control system and relate them to the example presented in Section 1.2.

**Process** In the previous example, the flow of liquid in and out of the tank, the tank itself, and the liquid all constitute a process to be placed under control with respect to the fluid level. In general, a process can consist of a complex assembly of phenomena that relate to some manufacturing sequence. Many variables may be involved in such a process, and it may be desirable to control all these variables at the same time. There are single-variable processes, in which only one variable is to be controlled, as well as multivariable processes, in which many variables, perhaps interrelated, may require regulation. The process is often also called the plant.

**Measurement** Clearly, to effect control of a variable in a process, we must have information about the variable itself. Such information is found by measuring the variable. In general, a measurement refers to the conversion of the variable into some corresponding analog of the variable, such as a pneumatic pressure, an electrical voltage or current, or a digitally encoded signal. A sensor is a device that performs the initial measurement and energy conversion of a variable into analogous digital, electrical, or pneumatic information. Further transformation or signal conditioning may be required to complete the measurement function. The result of the measurement is a representation of the variable value in some form required by the other elements in the process-control operation. In the system shown in Figure 1.3, the controlled variable is the level of liquid in the tank. The measurement is performed by some sensor, which provides a signal,  $s$ , to the controller. In the case of Figure 1.2, the sensor is the sight tube showing the level to the human operator as an actual level in the tank.

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## 编辑推荐

《过程控制仪表技术(第8版)》特色：《过程控制仪表技术(第8版)》从第1版（1977年）至第8版，历时三十余载，受到广泛欢迎。《过程控制仪表技术(第8版)》具有明显特色：测量技术和控制技术相结合。把工业电子学的知识和工业仪表中的模拟电路、信号采集系统中的数字电路相结合；把被控系统的特性和调节器的功能相结合。这样就为控制系统中的装置与系统、理论与实际相结合打下了基础。内容紧密联系实际，书中有很多实际控制系统和仪表装置的设计范例及典型方法，可供读者在实际工程中应用。

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## 精彩短评

- 1、拆开包装，封面上大大八个字“展示样书 请勿取走”，下面连pearson的防伪标签都是圆形的，写着样书非卖品，扉页里面一个大大的红章子“非卖品”。如果实在没有新书可以通知我啊，等等也没问题啊，互相沟通一下就能理解的事情，为啥要这么做呢？
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