

Practical

INSTRUMENTATION FOR AUTOMATION AND PROCESS CONTROL



YOU WILL LEARN:

- How to specify and design instrumentation systems for:
 - pressure
 - level
 - temperature
 - flow measurement
- Practical knowledge about instrumentation and control valves
- How to install process equipment correctly
- How to troubleshoot instrumentation systems and control valves
- An understanding of the major technologies used for instrumentation and control valves
- To correctly select and size control valves for industrial use

WHO SHOULD ATTEND:

- Electrical Engineers
- Energy Management Consultants
- Design Engineers
- Instrument Fitters
- Instrumentation Engineers
- Production Managers
- Chemical Engineers
- Instrument and Process Control Technicians
- Maintenance Engineers
- Automation Engineers
- Project Managers
- Electricians
- Consulting Engineers
- Process Engineers
- Mechanical Engineers



Technology Training that Works

THE WORKSHOP

The Practical Instrumentation for Automation and Process Control workshop is for engineers and technicians who need to have a practical knowledge of selection, installation and commissioning of industrial instrumentation and control valves.

In many respects a clear understanding and application of these principles is the most important factor in an efficient process control system. You can only achieve excellent control of your process when your instrumentation provides the correct information.

It is for those primarily involved in achieving effective results for the industrial processes they are responsible for. This would involve the design, specification and implementation of control and measurement equipment.

The workshop focuses on real applications, with attention to special installation considerations and application limitations when selecting or installing different measurement or control equipment.

WORKSHOP OBJECTIVES

On successful completion of this workshop you will be able to:

- specify and design instrumentation systems
- correctly select and size control valves for industrial use
- understand the problems with installing measurement equipment
- troubleshoot instrumentation systems and control valves
- isolate and rectify instrumentation faults
- understand most of the major technologies used for instrumentation and control valves

PRACTICAL SESSIONS

This workshop provides practical hands-on configuration of industrial instrumentation and highlights both the ease of setting up equipment and the traps and pitfalls that are often encountered.

Practical sessions include:

- process calibration using various standard equipment
- span and zero configuration
- sizing and selection calculations
- diagnostic tools
- 4-20 mA process simulation
- control valve sizing using software

THE PROGRAM

DAY ONE

INTRODUCTION

- Basic concepts
- Definitions
- Overview of pressure, level, temperature and flow
- Overview of valves

PRESSURE MEASUREMENT

- Principles
- Sources
- Transducers and elements
- Specifications
- Installation issues

LEVEL MEASUREMENT

- Principles
- Simple sight glasses
- Buoyancy tape systems
- Hydrostatic pressure
- Ultrasonic measurement
- Radiation measurement
- Electrical measurement
- Density measurement
- Installation issues

TEMPERATURE MEASUREMENT

- Principles
- Thermocouples
- Resistance temperature detectors
- Thermistors
- Liquid-in-glass, filled, bimetallic
- Pyrometers
- Installation issues

DAY TWO

FLOW MEASUREMENT

- Principles
- Differential pressure flowmeters
- Open channel flow measurement
- Oscillatory flow measurement
- Magnetic flow measurement
- Positive displacement
- Ultrasonic flow measurement
- Mass flow measurement
- Installation issues

CONTROL VALVES

- Principles
- Control valve types
- Selection
- Characteristics / trim
- Noise and cavitation
- Actuators and positioners
- Installation issues

PROCESS CONSIDERATIONS

- Transmitters
- Noise
- Material of construction

INTEGRATION OF THE SYSTEM

- Individual instrument error and total error
- Testing and commissioning



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K. Chetty

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