



شركة ميرك العربية السعودية  
MEIRC Saudi Arabia

## Control Valves and Actuator

**Duration 5 Days**

**Course Outlines:**

The seminar will introduce delegates to the different types of control valves and their associated terminology. The application of the different types of valves will be discussed along with their suitability for different operational duties. Installation, troubleshooting and maintenance will be dealt with in depth.

**Who should attend**

Engineers, technical personal responsible for the operation, testing and maintenance of control valves

**Objectives**

To provide attendees with knowledge control valves types; applications, operation, testing, calibration and troubleshooting.

**Course Outlines**

**1. Introduction to Control Valves**

- 1.1. What Is A Control Valve?
- 1.2. Process Control Terminology
- 1.3. Sliding-Stem Control Valve Terminology
- 1.4. Rotary-Shaft Control Valve Terminology
- 1.5. Control Valve Functions and Characteristics Terminology
- 1.6. Other Process Control Terminology

**2. Control Valve Performance**

- 2.1. Process Variability
- 2.2. Dead Band
- 2.3. Actuator-Positioner Design
- 2.4. Valve Response Time
- 2.5. Valve Type and Characterization
- 2.6. Valve Sizing
- 2.7. Economic Results

**3. Valve and Actuator Types**

- 3.1. Control Valves
- 3.2. Globe Valves
- 3.3. Single-Port Valve Bodies
- 3.4. Balanced-Plug Cage-Style Valve Bodies
- 3.5. High Capacity, Cage-Guided Valve Bodies
- 3.6. Port-Guided Single-Port Valve Bodies
- 3.7. Double-Ported Valve Bodies
- 3.8. Three-Way Valve Bodies
- 3.9. Rotary Valves
- 3.10. Butterfly Valve Bodies
- 3.11. V-Notch Ball Control Valve Bodies
- 3.12. Eccentric-Disk Control Valve Bodies
- 3.13. Eccentric-Plug Control Valve Bodies
- 3.14. Control Valve End Connections
- 3.15. Screwed Pipe Threads
- 3.16. Bolted Gasketed Flanges
- 3.17. Welding End Connections
- 3.18. Valve Body Bonnets
- 3.19. Extension Bonnets
- 3.20. Bellows Seal Bonnets
- 3.21. Control Valve Packing
- 3.22. PTFE V-Ring
- 3.23. Laminated and Filament Graphite



- 3.24. USA Regulatory Requirements for Fugitive Emissions
- 3.25. Characterization of Cage-Guided Valve Bodies Characterized Valve Plugs
- 3.26. Valve Plug Guiding
- 3.27. Restricted-Capacity Control Valve Trim
- 3.28. Actuators
- 3.29. Diaphragm Actuators
- 3.30. Piston Actuators
- 3.31. Electrohydraulic Actuators
- 3.32. Manual Actuators
- 3.33. Rack and Pinion Actuators
- 3.34. Electric Actuators

#### **4. Control Valve Accessories**

- 4.1. Positioners
- 4.2. Other Control Valve Accessories
- 4.3. Limit Switches
- 4.4. Solenoid Valve Manifold
- 4.5. Supply Pressure Regulator
- 4.6. Pneumatic Lock-Up Systems
- 4.7. Fail-Safe Systems for Piston Actuators
- 4.8. Electro-Pneumatic Transducers
- 4.9. Electro-Pneumatic Valve Positioners
- 4.10. PC Diagnostic Software

#### **5. Special Control Valves**

- 5.1. High Capacity Control Valves
- 5.2. Low Flow Control Valves
- 5.3. High-Temperature Control Valves
- 5.4. Cryogenic Service Valves
- 5.5. Customized Characteristics and Noise Abatement Trims
- 5.6. Valves Subject to Sulfide Stress Cracking

#### **6. Installation and Maintenance**

- 6.1. Proper Storage and Protection
- 6.2. Proper Installation Techniques
- 6.3. Read the Instruction Manual
- 6.4. Be Sure the Pipeline Is Clean
- 6.5. Inspect the Control Valve
- 6.6. Use Good Piping Practices
- 6.7. Control Valve Maintenance
- 6.8. Reactive Maintenance
- 6.9. Preventive Maintenance
- 6.10. Predictive Maintenance
- 6.11. Actuator Diaphragm
- 6.12. Stem Packing
- 6.13. Seat Rings
- 6.14. Grinding Metal Seats
- 6.15. Replacing Seat Rings
- 6.16. Bench Set