Control Valves Sizing, Selection and Maintentence

Program Description

This workshop is designed as a comprehensive guide to in-depth understanding of control valves. Participants will gain an invaluable insight into control valve types, construction, selection of size, choice of body and trim materials, components, and ancillaries etc.

This course will also provide a practical understanding of control valves, actuators, and positioners and their applications.

The workshop includes a hands-on approach to valve installation, maintenance and troubleshooting as well as to stripping, refurbishing and rebuilding valve/actuator assembly.

Who Should Attend?

This course is designed for personnel interested in acquiring practical knowledge of process control valves including sizing, selection, specification, installation, maintenance and applications. In particular professionals - Process Engineers, Process Control Engineers, Installation and Maintenance Technicians, Instrumentation technicians and fitters, Maintenance Engineers, Production Managers, etc. will benefit from attending this workshop.

Benefits

Benefits of the Workshop:

- Gain a greater understanding of the types of control valves and styles.
- Be better able to select the correct control valve for the job.
- Acquire a logical, analytical approach to control valve troubleshooting.
- Acquire understanding of routine maintenance.
- Describe how to adjust packing in a valve.
- Describe how to remove packing from a valve.
- Describe how to replace the packing in a valve.
- Describe procedure for disassembling a valve.
- Explain how lapping and spotting-in are performed on a valve seating area.
- Select optimum materials of construction to avoid corrosion and erosion
- Select and specify different types of control valves and the requirements in different applications
- Understand control valve characterisation and characteristic profiling
- Learn about ANSI/DN pipe sizes and pressure ratings
- Select the correct actuator type: electric, pneumatic, hydraulic
- Pick the correct positioner using our set of guidelines

Program Outline

- **Introduction to Control Valves**

  • Basic control system • Role of the final control element • Function and Selection • Process Applications • Different types and features of control valves • Valve Design • Types and Functions of Actuators • Control Valve Trim • Control Valve Safety.

- **Body and Bonnet Styles**

  •How to select the style that suits your piping layout and temperature pressure operating conditions.

- **Defining the Valve Flow Coefficient**

  • Choked flow • Pressure recovery • Velocity profiles • Reynolds number • Flashing and cavitation • Cavitation control • Trim selection • Water hammer.

- **Valve Construction**

  • ANSI and DN pipe sizes • ANSI Class and PN pressure ratings • Packing/stuffing box requirements • Control valve seat leakage classifications • Lapping the valves.

- **Valve Types**

  • Globe valves • Split body globe • Angle valve • Needle valves • Relief valves • Bar stock body • Gate valves • V-insert gate valve • Slotted movable disc • Rotating disk • Pinch valves • Diaphragm valves • Ball valves • Check valves • Trunnion ball valve • Ball segment valve • Characterised V-notch ball valve • Butterfly valve • Plug valve • Eccentric plug valve • Trim, guiding and connections.

- **Control Valve Characterisation**

  • Inherent characteristics • Installed characteristic • Characteristic profiling • Cavitation control • Noise production in control valves, prediction and control • Noise reduction.

- **Selection and Sizing of Valves and Actuators**

  • Fundamentals of Fluid Flow • Valve Selection Factors • Body selection guide • Trim selection guide • Actuator and accessory selection • Valve Sizing for: Liquid, Gas and Vapor Applications • Valve sizing – manual and computer based.

- **Actuators and Positioners**

  • Pneumatic control • I/p converter • Diaphragm actuators • Direct-acting • Reverse-acting • Springless • Cylinder/piston-type actuator • Hydraulic actuators • Electric actuators • Swing jet controller • Electric actuator Solenoid valves Digital actuators • Transfer mechanisms • Rack and pinion • Double crank • Scotch yoke • Valve positioners • Positioner guidelines • Digital positioners.

- **Valve Testing and Diagnostics**

  • Deadband and hysteresis • Testing for deadband/hysteresis • Stick-slip • Non-linearity • Testing a complete assembly • On-line diagnostics • Signature analysis • Bench Set • Spring calculations • Electronic torque monitoring • Non Destructive • Testing.

- **Valve and Actuator Refurbishment**

  • Stripping • Refurbishment • Rebuilding complete assembly.

- **Inspection and Installation of Control Valves**

  • Inspecting control valve components • Disassembly • Inspecting and reassembly • Installing the control valves.

- **Maintenance and Troubleshooting of Valves**

  • Valve routine maintenance • Maintenance preparation • Condition monitoring and troubleshooting • Mechanical troubleshooting • Electrical troubleshooting.

For any further information please contact us at:

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