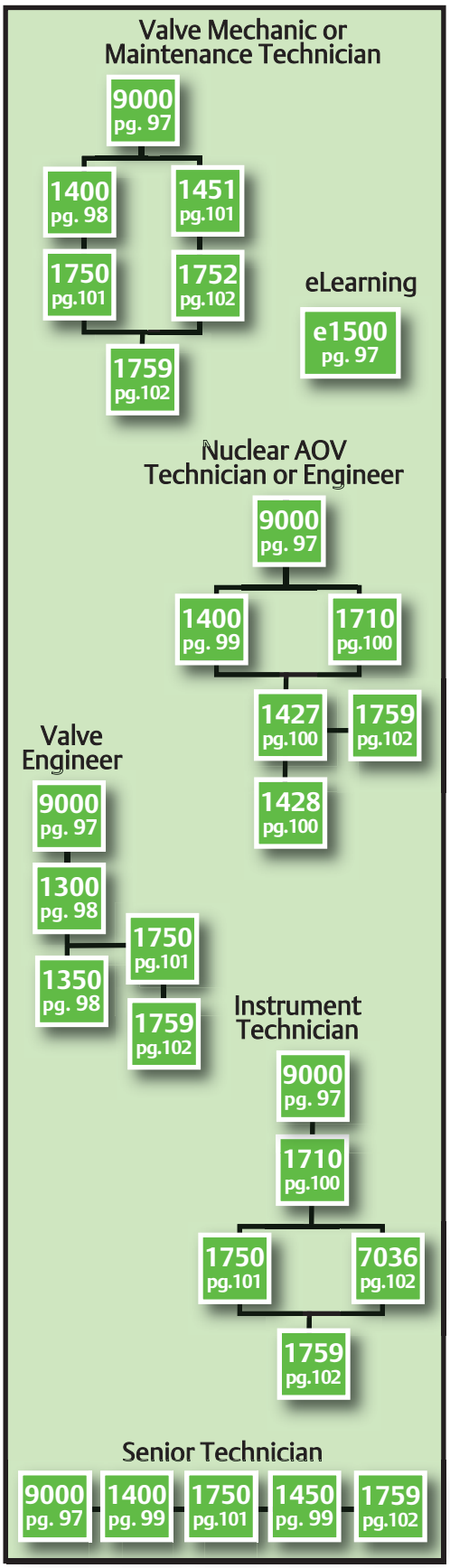
LEARNINGPATH



Introduction to Process Control

Course 9000 CEUs: 3.2

This Fisher course is for students that have little or no process experience.

Overview This course provides those new to the field with the basic, overall fluid process controls knowledge they need to better understand the function of automated control loops. Aspects of process control (measurement devices, controllers, final control elements, and fundamental control methods) are covered by classroom presentations and laboratory exercises that are intended to familiarize students with the function and application of the wide variety of equipment commonly found in process plants.

Prerequisites None. This is an intro course.

Topics

- Process Control Terminology and Symbols
- Process Loop Introduction
- Measurement Instrumentation for: - Flow;- Level;- Temp;- Pressure
- Instrument Calibration Concepts
- Final Control Elements: - Control Valves; - Actuators; - Control Valve Instrumentation
- Introduction to Loop Dynamics, Tuning and Control

Loop Tuning Short Course

Course 9006 CEUs: 1.4

This Fisher course is designed for those who have the job responsibility of tuning or monitoring industrial process control loops. Students will learn to tune controllers to meet the needs of each loop.

Overview Students will practice tuning on process simulation software using tuning methods that do not require calculations. The baseline method requires knowledge of the type of process, and the trial and error method requires making small setpoint bumps and changing controller gain and reset to meet the desired loop performance. Students will also learn open loop response testing and Lambda tuning to obtain greater loop accuracy, stability, and predictability.

Prerequisites None.

Topics

- Load Upsets; Process Noise
- Self Regulating Process
- Integrating Process (Level)
- Valve Deadband and Stick/Slip
- Limit Cycling; Baseline Controller Tuning
- Trial and Error Tuning / Lambda Tuning
- Process Time Constant, Deadtime, and Gain
- Positioner Application Guidelines

eLearning: Introduction to Fisher Control Valves

Course e1500 CEUs: 0.1

Overview This 1-hour (average duration) elearning course introduces anyone with no prior experience to industrial process control valves. Students are led on a self-paced discussion on how control valve designs vary, basic theory of operation, and how control valves function in a process control loop. Student interaction in the form of "Check your knowledge" and quiz assessments are used throughout to confirm student understanding.
Note: Course access is 3 months

Prerequisites None. However, a basic familiarity with Industrial Process Control is beneficial (e.g., see course e9025 Control Loop Foundation, page 75).

Topics

- Basic Terminology of Control Valve Types
- Uses of Control Valves
- Role of the Control Valve in Industrial Process
- Inherent Flow Characteristics
- Entities that Define Codes and Standards for Final Control Devices

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eLearning: Fisher Sliding Stem Control Valve Basics

Course e1501 NEW CEUs: 0.1

Overview

This 1/2-hour (average duration) course introduces the basic definition of sliding stem control valves, types of sliding stem valves, their common components, guiding methods, typical uses, flow characteristics, the general sizing capacity and selection guidelines.
Note: Course access is 3 months
Prerequisites None. However, a basic familiarity with Industrial Process Control is beneficial (e.g., see course e9025 Control Loop Foundation pg. 75)

Topics

- Sliding Stem Valves
- Types of Globe Valves
- Plug Design, Gaskets and Trim
- Bonnet
- Packing Assembly
- End Connections
- Pressure and Temperature
- Flow Direction
- Shutoff
- General Sizing and Selection Guidelines

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Control Valves

The twin forces of advancing technology, exemplified by the rapid acceptance of FIELDVUE digital valve controllers, and the merging of the valve and instrument technician crafts in many plants are making control valve education more important today than ever before. These interrelated trends necessitate higher levels of education on the part of those responsible for valve engineering, maintenance and operation. Courses for valve and instrument technicians explain what's required to maintain modern control valves and demonstrate the skills necessary to do that job effectively. These classes are very structured, but students have plenty of opportunities to practice newly learned skills and receive feedback from experts in the field.The goal is to reduce the number of poorly operating control valves throughout industry in order to enhance processing and reduce downtime.

eLearning: Fisher Rotary Control Valve Basics

Course e1502 NEW CEUs: 0.1

Overview

This 1/2-hour (average duration) course introduces the basic definition of rotary control valves, defines the body types and styles of rotary valves, as well as their common components, flow characteristics and considerations, and finally the general sizing capacity and selection guidelines.

Prerequisites

None. However, a basic familiarity with Industrial Process Control is beneficial (e.g., see course e9025 Control Loop Foundation pg. 75)

Topics

- Butterfly Control Valves
- Disc designs
- Rotary Ball Valves
- Ball Styles
- Eccentric Plug Valves
- End Connections
- Packing Options
- General Sizing and Selection

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eLearning: Fisher Pneumatic Actuator Basics

Course e1503 NEW CEUs: 0.1

Overview

This 1/2-hour (average duration) course introduces the basic definition of an actuator, lists the types of actuators for sliding stem and rotary control valves, states the general components of an actuator and lists the general actuator selection guidelines. **Note:** Course access is 3 months

Prerequisites None. However, a basic familiarity with Industrial Process Control is beneficial (e.g., see course e9025 Control Loop Foundation pg. 75)

Topics

- Function of an Actuator
- Pneumatic Spring-and-Diaphragm Actuators
- Pneumatic Piston Actuators
- Electric Actuators
- Electro-Hydraulic Actuators
- Actuator General Selection Guidelines

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Control Valve Engineering I

Course 1300 CEUs: 3.2

This course is for engineers, technicians and others responsible for the selection, sizing and application of control valves, actuators and control valve instrumentation.

Overview

This course reviews design and operating principles of control valves, actuators, positioners and related accessories. It describes the sizing and selection methods for a broad variety of control valve assemblies. Students will solve several demonstration sizing and selection problems using Fisher Specification Manager and published materials, plus participate in equipment demonstrations and hands-on workshops. Students who complete this course will:

- select the proper valve characteristic for a given process
- choose suitable styles of control valves for an application
- size control valves and actuators
- properly apply positioners and instruments

Prerequisites

Some experience with industrial controls equipment including control valves and actuators would be helpful.

Topics

- Control Valve Selection: Rotary/Sliding Stem
- Actuator Selection and Sizing
- Corrosion Resistant Valves
- Liquid Valve Sizing
- Gas Valve Sizing
- Positioners and Transducers
- Valve Application Guidelines
- Valve Characteristics
- Valve Packing Considerations
- Cavitation
- Valve Noise

Control Valve Engineering II

Course 1350 CEUs: 3.2

This course is for practicing engineers and senior technicians who are seeking advanced training in control valve selection and sizing, and application problem solving.

Overview

This course reviews basic sizing and selection concepts. It then progresses to advanced concepts used when selecting and sizing control valves for severe service and unusual applications. The course includes lectures and numerous problem-solving sessions that make extensive use of Fisher Specification Manager software. Students who complete the course will:

- select and size control valves to reduce aerodynamic noise
- select and size control valves for cavitating applications
- select valve types and options for corrosive and erosive fluids
- size control valves for two-phase flow and hydrocarbon mixtures

Prerequisites

Course 1300 or have equivalent experience (minimum of two years specifying control valves and instrumentation). Familiarity with Fisher Specification Manager is required.

Topics

- Aerodynamic Noise/Whisper Trim
- Cavitation Issues and Solutions
- Steam Conditioning Valves
- High Pressure/Temperature Issues
- Sizing for Two Phase Flow, Fluid Mixtures
- Corrosive/Erosive Service
- Actuators: Stroking Speed, Hysteresis, and Other Control Application Guidelines

Valve Technician I

Course 1400 CEUs: 3.2

This introductory course is for valve mechanics, maintenance personnel, instrument technicians, and others who are responsible for maintaining control valves, actuators and control valve instrumentation.

Overview

This course explains how valves and actuators function and how they are installed and calibrated. It emphasizes installation, troubleshooting, parts replacement, and calibration of control valves, actuators, positioners and digital valve controllers. Those who complete this course will be able to:

- correctly perform installation procedures
- perform basic troubleshooting
- properly apply and calibrate, positioners and FIELDVUE™ digital valve controllers
- change valve trim, gaskets and packing

Prerequisites

Some experience in instrument calibration and in control valve maintenance, installation, and operation would be helpful.

Topics

- Control Valve Terminology
- Globe Valves
- Packing
- Actuators, Positioners and Digital Valve Controllers
- Bench Set
- Seat Leak Testing
- Ball Valves
- Butterfly Valves
- Eccentric Disc Valves
- Valve Characteristics

Baumann Valve Technician

Course 1402 CEUs: 2.1

Overview

This course explains how Baumann valves and actuators function and how they are installed and calibrated. It emphasizes installation, troubleshooting, parts replacement, and calibration of control valves, actuators, positioners and digital valve controllers. Those who complete this course will be able to:

- correctly perform installation procedures
- perform basic troubleshooting
- properly apply and calibrate positioners and FIELDVUE™ digital valve controllers
- change valve trim, gaskets and packing
- properly adjust sanitary valves

Prerequisites

Some experience in instrument calibration and in control valve maintenance, installation, and operation would be helpful.

Topics

- 24000 General Service
- Sanitary Valves
- Low Flow and Specialty Valves
- Packing
- Bench Range
- Seat Leak Testing
- Actuators
- Positioners and FIELDVUE™ Digital Valve Controllers

Valve Technician II

Course 1450 CEUs: 3.2

This advanced course is for experienced valve mechanics and maintenance personnel, instrument technicians, and others who will benefit from a broadened perspective of control valve performance and maintenance issues.

Overview

This course discusses a basic approach to troubleshooting and correcting many common control valve problems. Fisher® Specification Manager software is introduced to give the student a better feel for the sizing and selection process of the valve and actuator. Problems such as cavitation, flashing, and aerodynamic noise are also discussed, as well as, common solutions to these problems using different control valve trims and materials. Instrumentation topics are expanded from course 1400 (Valve Technician I) to include troubleshooting and advanced calibration for split ranging, non-compatible signals, or using additional instruments such as a volume booster and trip valves. Loop performance due to stick-slip, high friction, and improper loop tuning are also discussed, diagnostic software such as ValveLink and Flow Scanner is introduced to further demonstrate possible troubleshooting tools.

Prerequisites

Course 1400

Topics

- Control Loop Basics
- Major Loop Components
- Control Loop Performance
- Influences on Loop Performance
- Valve Selection and Sizing
- Valve Troubleshooting
- Actuator Selection and Sizing
- Actuator Troubleshooting
- Instrument Selection
- Instrument Troubleshooting
- Severe Service Considerations
- Diagnostic Software

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FlowScanner Data Acquisition and Interpretation

Course 1427 CEUs: 2.8

This course is for personnel who will perform and interpret control valve diagnostic testing using a FlowScanner.

Overview

This course uses lecture and hands-on labs to teach students to properly acquire and analyze diagnostic data using the FlowScanner. This course teaches proper setup of hardware and software, accurate entry of data, and other procedures that are required to ensure accuracy when acquiring data. Also covered are good techniques in interpreting and analyzing the collected data. Actual case histories form a basis for teaching interpretation skills. Students will test and diagnose a sampling of valves in which specific problems have been ntroduced. Students who complete this will:

- navigate features of FlowScanner software
- correctly mount sensors and related FlowScanner hardware on standard air-operated valves (AOV's)
- enter valve, instrument, and actuator data
- correctly enter test parameters
- perform various step and stroking tests to collect diagnostic data
- analyze typical/atypical FlowScanner data
- create/view standard FlowScanner reports

Prerequisites

Course 1400 or course 1710, or significant experience in valve and instrument operation/maintenance procedures.

Topics

- Flowscanner Hardware/Software Overview
- In-Depth Software Navigation
- Setup and Testing Techniques
- Data Entry & Test Criteria Best Practices
- Data Management
- Report Generation/Expected Results
- Background Software Routines and Equations for the Analysis Numbers
- Case Study Analysis- Including Discussions of Valve/Instrument/Installation Problems
- Laboratory Activities/Support

Advanced FlowScanner Diagnostic Interpretation

Course 1428 CEUs: 1.8

This course is for personnel who are responsible for interpreting plots and other diagnostic data that is acquired with the Fisher FlowScanner. This course focuses on data interpretation. Data acquisition is taught in Course 1427.

Overview Because of the advanced nature of this class, the prerequisite is strictly enforced. A pre-test and a control valve awareness test are used to confirm applicant readiness. A brief review of FlowScanner software confirms student familiarity with test setups, pressure and travel channels, and the objectives of all available test procedures. The course is based on a structured combination of lectures and hands-on labs to teach students how to identify problems in control valve assemblies. Emphasis is placed on determining and confirming overall control valve health and condition by examining each of the major components of the assembly: I/P, positioner, actuator, and valve body. Report generation and some field tips are also presented. To capitalize on learning from shared experiences, students are encouraged to bring in test data from an interesting scenario or a current problem. Those who complete this course will:

- select the appropriate FlowScanner test for a given scenario.
- understand the impact of scan rates on the appearance and interpretation of acquired data.
- analyze FlowScanner test data to determine overall control valve health by evaluating the condition of the various components of the assembly.
- identify multiple anomalies in a single assembly.
- use FlowScanner functions to generate Quick Reports.
- learn how to perform a step test on a discrete valve without interrupting power to the valve.

Prerequisites Course 1427 and a minimum of six months of diagnostic testing with the Flowscanner.

Topics

- Review of Various FlowScanner Tests and Specific Objectives of Each
- Impact of Test Configuration Errors
- Data Interpretation from Tests of "Bugged" Valve Assembles
- Multiple Anomalies Found in Control Valves
- Exporting Data
- Generating Quick Reports
- Interpretation of Difficult Uncovered Control Valve Problems

Note: Educational Services supplies all Control Valve equipment and FlowScanners. No Exceptions.

Instrument Technician

Course 1710 CEUs: 3.2

This course is for instrument technicians and others, responsible for pneumatic and electronic instrument calibration, installation and troubleshooting.

Overview

This course covers the principles of operation, calibration and installation procedures for electronic and pneumatic instruments. Computer process simulations, live loops and hands-on workshops demonstrate loop dynamics. Students will:

- calibrate a variety of pneumatic and electronic instruments
- correctly perform installation procedures
- perform basic troubleshooting, basic controller tuning, positioner and FIELDVUE™ digital valve controller application

Prerequisites

Some experience in electronic and pneumatic instrument maintenance and calibration would be helpful.

Topics

- Actuators and Bench Set
- Controller Tuning
- Current to Pneumatic (I/P) Transducers
- Instrument Terminology
- Pneumatic Temperature Controllers (Filled Bulb)
- Pneumatic Pressure Controllers
- Pneumatic and Electro-Pneumatic Positioners
- Pneumatic Displacer Level Controllers
- FIELDVUE™ Digital Valve Controller
- Pneumatic and FIELDVUE™ Digital Level Controller

Valve Maintenance with Digital Valve Controller Calibration

Course 1451 CEUs: 3.2

This introductory course is for valve mechanics, maintenance personnel, instrument technicians, and others who are responsible for maintaining control valves, actuators and control valve instrumentation.

Overview
This is course will cover sliding stem and rotary valves and actuators, valve and actuator setup, maintenance, repair and troubleshooting, installation and calibration of the FIELDVUE™ digital valve controllers using the 475 Field communicator. An overview of ValveLink® Mobile will be included.

Prerequisites
Experience in instrument calibration and in control valve maintenance, installation, and operation would be helpful.

Topics
- Control Valve Terminology
- Globe Valves/Packing
- Actuators
- Bench Set
- Ball Valves / Butterfly Valves / Eccentric Disc Valves
- Valve Characteristics
- FIELDVUE™ Digital Valve Controller Theory of Operation
- HART Communication Signal
- FIELDVUE Instrument Installation
- 475 Field Communicator
- Instrument Configuration and Calibration
- Instrument Troubleshooting
- Valvelink™ Mobile Overview

FIELDVUE Digital Valve Controller Setup and Diagnostics using 475 Field Communicator and ValveLink

Course 1750 CEUs: 3.2*

This course is for technicians, engineers, and others responsible for installing, configuring, calibrating, and basic troubleshooting of FIELDVUE digital valve controllers using 475 Field Communicator and ValveLink Software. This course is a combination of 1751 and 1752 taken in the same week.

Overview
The course provides the fundamental skills necessary to install and mount FIELDVUE™ digital valve controllers onto a Sliding Stem and Rotary Valve / Actuator, and to configure and calibrate FIELDVUE instruments using the 475 Field Communicator. Students will also be able use ValveLink software to run diagnostics.

Prerequisites
Control valve experience and/or course 1400, 1300, 1710, or 1451.

Topics
- FIELDVUE Digital Valve Controller Theory of Operation
- FIELDVUE Instrument Installation
- 475 Field Communicator Configuration and Calibration
- Control Loop Wiring Practices
- Introduction to ValveLink™
- ValveLink Tag and Database Issues
- Configuration and Calibration with ValveLink
- ValveLink™ Diagnostics
- ValveLink™ Performance Diagnostics
- Instrument Troubleshooting using ValveLink™

Fundamentals of HART Based FIELDVUE Digital Valve Controller using the 475 Field Communicator

Course 1751 CEUs: 1.4

This course is for technicians, engineers and others responsible for installing, calibrating and basic troubleshooting FIELDVUE instruments using the 475 Field Communicator.

Overview
This course provides the skills necessary to:
- install and mount FIELDVUE™ digital valve controller onto Sliding Stem Actuator/ Valve and Rotary Actuator/Valve Assemblies
- configure and calibrate FIELDVUE Instruments with the Field Communicator

Prerequisites
Control valve experience and/or course 1400, 1300, 1710, or 1451.

Topics
- FIELDVUE Digital Valve Controller Theory of Operation
- FIELDVUE Instrument Installation
- Field Communicator for Instrument Configuration, Calibration and Troubleshooting
- ValveLink™ Mobile Overview

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ValveLink™ Software for Configuration and Calibration of FIELDVUE Digital Valve Controllers

Course 1752 CEUs: 1.8

This course is for technicians, engineers and others responsible for installation, calibration and diagnostics for FIELDVUE digital valve controllers and ValveLink™ software. The primary focus of this course is to provide a comprehensive experience in managing digital valve controllers using the ValveLink™ software.

Overview
This lecture/lab style course provides hands-on experience working with FIELDVUE digital valve controller and ValveLink™ software. Students will be able to execute ValveLink™ calibration and diagnostic routines, and create an instrument database.

Prerequisites
Control valve experience and/or course 1400, 1300, 1710, or 1451.

Topics
- Introduction to ValveLink™ Software
- ValveLink™ Tag and Database Management
- Configuration with ValveLink™
- Calibration with ValveLink™
- ValveLink™ Advanced and Performance Tier Diagnostics
- Troubleshooting
- Introduction to Diagnositc Data Interpretation

ValveLink™ Software for Diagnostics of FIELDVUE™ Digital Valve Controller

Course 1759 CEUs: 1.8

This course teaches the techniques necessary to collect and interpret valve diagnostic tests performed using ValveLink™ software.
Overview This course uses practical excercies and discussions to teach the student to interpret and analyze diagnostic data obtained using FIELDVUE Digital Valve Controllers and ValveLink™ software. Students will perform diagnostic tests on a variety of valve/actuator combinations and use the data to determine bench set, dynamic error band, seat load, spring rate and other pertinent parameters. Students will also perform comparison tests on valves/actuators containing assembly or operating flaws and use the data for troubleshooting purposes.
Prerequisites Completion of courses: 1750, 1752 or 7036 prior to attending.
Topics
- Pneumatic Control Valve Terminolog
- Features of the Digital Valve Controller and ValveLink™ Software
- ValveLink™ Diagnostic Tests
- Data Interpretation
- Troubleshooting Techniques
- Comparison Testing Techniques
- Performance Diagnostics

Fisher FIELDVUE™ Digital Valve Controller with AMS ValveLink™ SNAP-ON

Course 7022 CEUs: 2.1

This course is designed for technicians and engineers to commission, calibrate, configure, maintain, and troubleshoot Fisher FIELDVUE™ digital valve controllers using the AMS ValveLink™ SNAP-ON to AMS Device Manager.
Overview The course delves into device-specific techniques for commissioning, maintaining, and troubleshooting Fisher FIELDVUE™ Instruments.
Prerequisites Control valve experience or course1400, 1300, 1710 or 1451. Basic familiarity with Fisher FIELDVUE™ instruments and AMS Suite: Intelligent Device Manager, course 7020, would be helpful.
Topics
- Introduction to AMS Device Manager
- Getting Started with AMS Device Manager
- Replacing and Deleting Devices
- Field Communicator
- Using the Audit Trail
- Monitoring System Alerts
- DVC6000 View from AMS Device Manager
- AMS ValveLink SNAP-ON Features and Functionality
- AMS ValveLink SNAP-ON Digital Valve Controller Diagnostics

FOUNDATION™ fieldbus FIELDVUE™Digital Valve Controller

Course 7036 CEUs: 2.1

This course teachs technicians and engineers the basics of FOUNDATION™ fieldbus digital valve controller installation, configuration, calibration, and troubleshooting using 475 Field Communicator, and ValveLink™ software.

Overview
The course reviews the role and function of control valve positioners followed by a series of hands-on exercises to disassemble, inspect, assemble, install, and commission a fieldbus FIELDVUE™ digital valve controller. During commissioning, students will learn the basics of the FOUNDATION™ fieldbus protocol, the role of function blocks, addressing, modes and status. Students will configure, calibrate, and commission devices using the 475 Field Communicator and ValveLink™ software. Hands-on exercises also teach students how to perform detailed setup routines and how to run and collect data for various ValveLink™ diagnostics.

Prerequisites A basic familiarity with positioners and control valve basics is required. Course 1400 is recommended.

Topics
- Positioner Basics
- FOUNDATION™ fieldbus Overview
- FIELDVUE™ Digital Valve Controller Installation and Mounting
- Modes and Status
- Configuration/Calibration
- Configuration and Calibration with the 475 Field Communicator
- ValveLink™ Setup Wizard/Detailed Setup
- Tuning
- Tag Management
- Pressure Control
- ValveLink™ Diagnostics
- FIELDVUE Instrument Troubleshooting