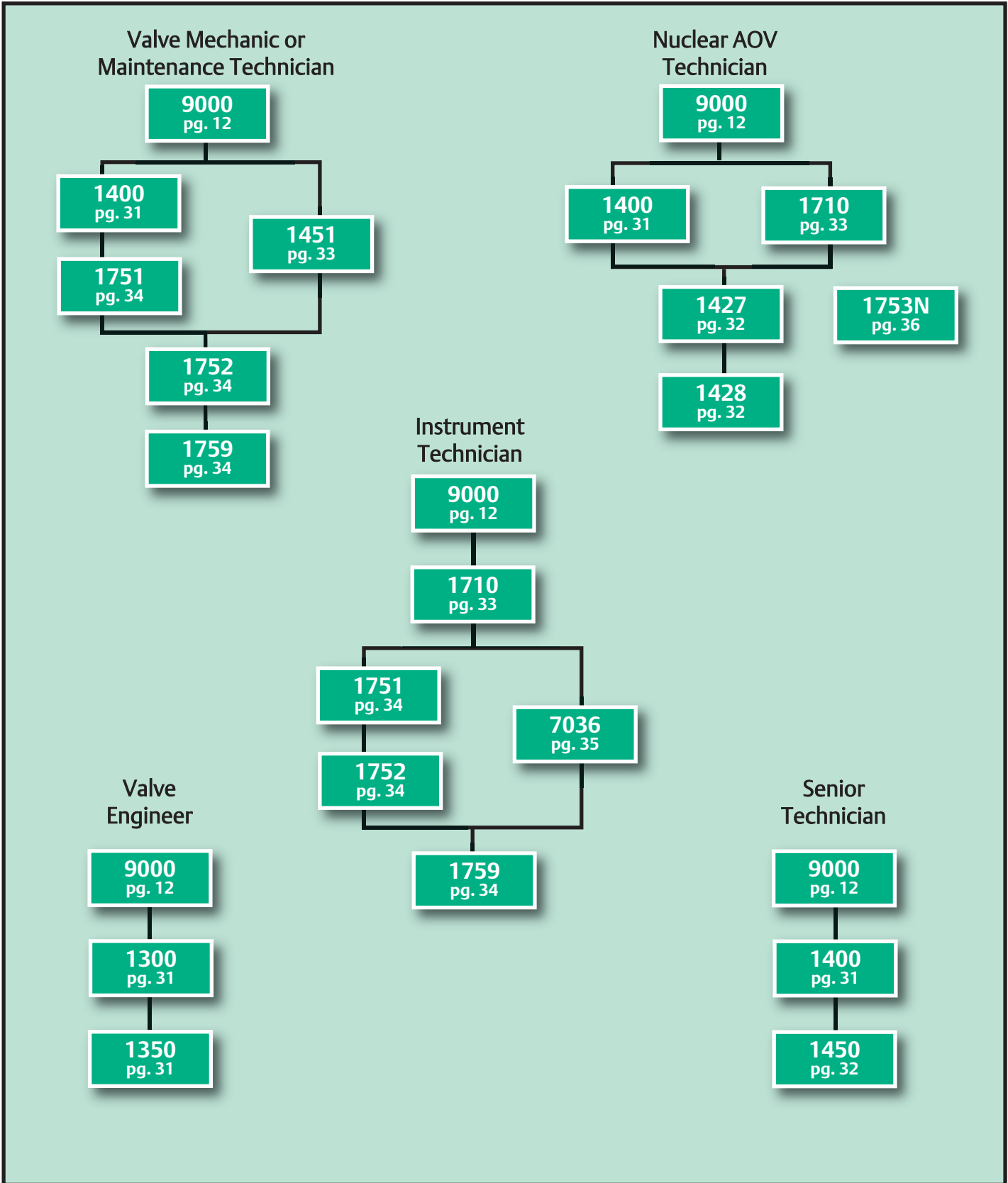


LEARNING PATH





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.

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 4-1/2 day course explains how to select the correct control valve, actuator and accessories to operate through the full range of process conditions. This course covers general applications and emphasizes the sizing and selection methods for a broad variety of control valves and actuators. Students will solve various sizing and selection problems using published materials and software, plus participate in equipment demonstrations and 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
- select the best actuator for all applications
- properly apply positioners and instruments

Prerequisites

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

Topics

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

Price \$2,200

Location	Start Date 2012
Marshalltown, IA	1/30, 2/27, 3/26, 5/7, 6/11, 7/30, 9/24, 10/29, 12/3
Las Vegas, NV*	2/14, 9/18
Pasadena, TX*	4/10
Sherman, TX*	5/15, 11/13

*4-days in length; 2.8 CEUs please reference Course 1300R; additional \$150

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 4-1/2 day course proceeds from a review of basic sizing and selection concepts 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 Firstvue software and other sizing and selection tools. 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

Control Valve Engineering course (Course 1300) or have equivalent experience (minimum of two years specifying control valves and instrumentation). Familiarity with Firstvue is recommended.

Topics

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

Price \$2,350

Location	Start Date 2012
Marshalltown, IA	3/5, 5/14, 8/6, 11/5
*4-days in length; 2.8 CEUs please reference Course 1350R; additional \$150	

Valve Technician I

Course 1400 CEUs: 3.2

Overview

This 4-1/2 day 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. Students spend over 50% of their time in hands-on workshops. Those who complete this course will be able to:

- correctly perform installation procedures
- perform basic troubleshooting
- properly apply and calibrate, positioners and 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
- Special Service Valves
- Valve Characteristics
- Control Valve Noise and Cavitation

Price \$2,100

Note: Valve Technician II (Course 1450) to enroll call 780-468-5463.

Location	Start Date 2012
Marshalltown, IA	1/9, 3/12, 5/21, 7/16, 10/1, 12/10
Las Vegas, NV*	1/17, 5/8, 11/6
Pasadena, TX*	6/12, 10/9
Sherman, TX*	3/6
Edmonton, AB	2/27, 5/7, 9/10, 11/19
*4-days in length; 2.8 CEUs please reference Course 1400R; additional \$150	

To enroll in Control Valve courses please call 800-338-8158 or 641-754-3771. For additional contact information refer to the appropriate contact on page 107. Updated dates & locations are available on our website at www.emersonprocess.com/education.



Valve Technician II

Course 1450 CEUs: 3.2

Overview

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

Prerequisites

Valve Technician I, Course 1400

Topics

- Control Loop Basics
- Major Loop Components and Their Functions
- Piping & Instrumentation Drawings (P & ID's)
- Basic Component Symbolology
- Connections and Wiring
- Control Loop Performance
- Loop Performance Objectives
- Influences On Loop Performance
- Valve Selection and Sizing
- Actuator Sizing
- Bench Set and Stem Connection
- Loading Pressure Instrument Selection
- Loading Pressure Instrument Calibration
- Accessory Selection and Configuration
- Controller Tuning
- Severe Service Considerations
- Troubleshooting Basics
- Diagnostics
- Process Variability
- Performance Maintenance Issues
- Tour of Flow Lab Differentiation Loops

Price \$2,150

Location

Marshalltown, IA
Edmonton, AB

Start Date 2012

Call to Schedule
6/4, 10/22

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 4-day 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 introduced. 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

Price \$2,450

Location

Marshalltown, IA

Start Date 2012

3/12, 5/7, 8/27, 12/17

Advanced FlowScanner Diagnostic Interpretation

Course 1428 CEUs: 2.1

This 3-day 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 Assemblies
- 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.

Price \$2,400

Location

Marshalltown, IA

Start Date 2012

Call to Schedule

Instrument Technician**Course 1710 CEUs: 3.2**

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

Overview

This 4-1/2 day course covers the principles of operation, calibration and installation procedures for electronic and pneumatic instruments. Computer process simulations and live loops are used to demonstrate loop dynamics. Approximately 50% of this course consists of hands-on workshops. Students will:

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

Prerequisites Some experience in electronic and pneumatic instrument maintenance and calibration would be helpful, but not required.

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 Digital Level Transmitters

PC-ControlLAB™ 3 and Builder (Part # D750496X012) is used in course 1710. For more information, visit our website at: emersonprocess.com/education

Price \$2,100

Location Marshalltown, IA **Start Date 2012**
2/6, 4/9, 6/18, 9/10, 11/12

Valve Maintenance with Digital Valve Controller Calibration**Course 1451 CEUs: 3.2**

Overview This is a 4-1/2 day session. The first 2-days of the course will cover sliding stem and rotary valves and actuators. Topics will include valve and actuator setup, maintenance, repair and troubleshooting. The following 2-1/2 days will be focused on the installation and calibration of the DVC 2000 and 6000 series digital valve controllers using the 375 handheld communicator. An overview of AMS ValveLink® Software will be included. Students spend 50% of their time in hands-on workshops. Students who complete this course will be able to:

- correctly perform installation procedures
- perform basic troubleshooting
- change valve trim, gaskets and packing
- install and mount a digital valve controller onto a sliding stem actuator/valve and rotary actuator/valve
- configure and calibrate FIELDVUE® Instruments with the HART Model 375 Communicator

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
- Control Valve Noise and Cavitation
- Digital Valve Controller Theory of Operation
- HART Communication Signal
- FIELDVUE Instrument Installation
- HART Model 375 Handheld Communicator
- Instrument Configuration and Calibration
- Instrument Troubleshooting
- Control Loop Wiring Practices

Price \$2,100

Location Marshalltown, IA **Start Date 2012**
Marshalltown, IA 2/27, 4/23, 9/17
Las Vegas, NV* 7/10
Sherman, TX* 8/21
Pasadena, TX* 1/24
* 4-days in length; 2.8 CEUs please reference Course 1451R; additional \$150



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Fundamentals of HART Based FIELDVUE Digital Instruments and the Handheld Communicators

Course 1751 CEUs: 1.4

This course is for technicians, engineers and others responsible for installing, calibrating and basic troubleshooting FIELDVUE and related instruments using the 375/475 Handheld Communicator. The primary focus of this course is to provide a comprehensive experience in managing digital valve controllers using the HART 375 or 475 Handheld Communicator.

Overview

This 2-day course provides the fundamental skills necessary to:

- install and mount a DVC2000 & DVC6000/6200 instrument onto a Sliding Stem Actuator/ Valve and Rotary Actuator/Valve Assemblies
- configure and calibrate FIELDVUE Instruments with the HART Model 375/475 Handheld Communicator

This lecture/lab style course provides maximum class time with hands-on experience working with FIELDVUE instrumentation and the HART Model 375/475 Handheld Communicator. Proper configuration and calibration of the Digital Valve Controller will be featured.

Prerequisites

One to two years of experience and/or course 1400, (Valve Technician I).

Topics

- FIELDVUE Theory of Operation
- DVC2000 & DVC6000/6200 Families of Digital Valve Controller
- FIELDVUE Instrument Installation
- HART Model 375/475 Handheld Communicator
- Instrument Configuration and Calibration
- Instrument Troubleshooting
- Control Loop Wiring Practices, Tri-loop and 775 Thum
- ValveLink™ Mobil Overview

Price \$1,200

Location	Start Date 2012
Marshalltown, IA	1/30, 3/19, 5/14, 6/25, 8/13, 10/15
Edmonton, AB	2/6, 5/28, 11/5
Burnaby, BC	3/26

ValveLink™ Software and Diagnostics for FIELDVUE - Operations

Course 1752 CEUs: 1.8

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

Overview

This 2-1/2 day lecture/lab style course provides maximum class time with hands-on experience working with FIELDVUE DVC instrumentation and ValveLink™ Diagnostic Software. Students will be able to execute ValveLink™ Diagnostic routines and create an instrument database. HART multiplexer technology will also be explored. This is a continuation course for course 1751, Fundamentals of FIELDVUE Digital Instruments and the 375/475 Handheld Communicator.

Prerequisites

Fundamentals of FIELDVUE and the 375/475 Handheld Communicator, (Course 1751) or Valve Maintenance with Digital Valve Controller Calibration (Course 1451) or Instrument Technician (Course 1710)

Topics

- Introduction to ValveLink™ Software
- ValveLink™ Tag and Database Management
- Configuration with ValveLink™
- Calibration with ValveLink™
- ValveLink™ Advanced and Performance Tier Diagnostics
- HART Multiplexer
- Troubleshooting

Price \$1,400

Location	Start Date 2012
Marshalltown, IA	2/1, 3/21, 5/16, 6/27, 8/15, 10/17
Edmonton, AB	2/8, 5/30, 11/7
Burnaby, BC	3/28

ValveLink™ Diagnostics for FIELDVUE - Digital Valve Controller Data Interpretation

Course 1759 CEUs: 1.8

This course is designed to teach the techniques necessary to collect and interpret valve diagnostic tests performed using ValveLink™ software.

Overview

This 2-1/2 day course uses classroom lectures and hands on workshops 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. Students who complete this course will:

- use/understand diagnostic terminology
- interpret ValveLink™ diagnostic traces and determine bench set, packing friction, seat load, spring rate, dynamic error band and a number of other common valve parameters
- use diagnostic traces to troubleshoot problems in valve/actuator assemblies
- use on-line Performance Diagnostics to troubleshoot/analyze friction & dead-band

Prerequisites Students must have completed courses: 1751 & 1752 prior to attending.

Topics

- Pneumatic Control Valve Terminology
- Features of the Digital Valve Controller and ValveLink™ Software
- ValveLink™ Diagnostic Tests
- Data Interpretation
- Troubleshooting Techniques
- Comparison Testing Techniques
- Performance Diagnostics

Price \$1,800

Location	Start Date 2012
Marshalltown, IA	3/27, 5/22, 8/21, 10/23
Edmonton, AB	2/13, 11/12

AMS Device Manager with Fisher HART**Course 7022 CEUs: 2.1**

This 3-day course is designed to teach technicians and engineers how to commission, calibrate, configure, maintain, and troubleshoot Fisher smart devices using AMS Device Manager and the ValveLink SNAP-ON.

Overview

The course begins with an introduction to the features and functionality of the AMS Device Manager. It proceeds to discuss important database design and management issues, and then delves into device-specific techniques for commissioning, maintaining, and troubleshooting the following Fisher smart devices:

- DVC6000 / DLC3000 Instruments

Prerequisites

None, though a basic familiarity with Fisher smart devices will be beneficial.

Topics

- Introduction to AMS Device Manager
- Getting Started with AMS Device Manager
- Viewing and Modifying Devices
- Role and Function of the Database
- Database Architecture
- Database Design Considerations
- Database Maintenance Issues
- Managing Device Configurations
- Replacing and Deleting Devices
- HART Communicator
- Using the Audit Trail
- Monitoring System Alerts
- DVC6000 View from AMS Device Manager
- ValveLink SNAP-ON Features and Functionality
- ValveLink SNAP-ON Digital Valve Controller Diagnostics

Price \$2,000

Location Marshalltown, IA **Start Date 2012**
Call to Schedule

FOUNDATION™ fieldbus FIELDVUE**Course 7036 CEUs: 2.1**

This 3-day course is designed to teach technicians and engineers the basics of FOUNDATION™ fieldbus digital valve controller installation, configuration, calibration, and troubleshooting using 375/475 Handheld, ValveLink™ software and DeltaV, and AMS Intelligent Device Manager.

Overview

The course begins with a review of the role and function of control valve positioners and proceeds through a series of hands-on exercises that require the student to disassemble, inspect, assemble, install, and commission a fieldbus 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 both 375/475 Handheld, ValveLink™ software and DeltaV. Hands-on exercises also teach students how to perform detailed setup routines and how to run and collect data for various ValveLink™ diagnostics. The class ends with a troubleshooting session that presents common problems and their solutions.

Prerequisites None, though a basic familiarity with positioners - preferably digital valve controllers - and control valve basics will be most useful.

Topics

- Positioner Basics
- FOUNDATION™ fieldbus Overview
- Digital Valve Controller Installation and Mounting
- Modes and Status
- Configuration/Calibration with DeltaV™
- Configuration and Calibration with the 375/475 Field Communicator
- Intro. to AMS ValveLink Fieldbus Functionality
- ValveLink™ Setup Wizard/Detailed Setup
- Tuning
- Tag Management
- Pressure Control
- ValveLink™ Diagnostics
- FIELDVUE Instrument Troubleshooting
- (Optional) Configuration/Calibration with NI Tools

Price \$2,000

Location Marshalltown, IA **Start Date 2012**
4/10, 7/31, 10/2

eLearning: Fisher® Valve Fundamentals**Course e9020 CEUs: .4****Overview**

This course is for valve technicians, field operators, or anyone new to control valves and actuators. This course covers the basic components of control devices including control valves, related trim parts, and actuators.

Those who view this course will learn:

- Terminology and Nomenclature
- Ratings: ASTM Pressure/Temperature and ANSI Shutoff
- Guiding, Balancing, and Characterization Options
- Basic Control Valve Design Variations

Time to Complete: 4 - 6 hours

Click below to sample:

<http://emersonprocess.acrobat.com/p59908286/>

This course is also available in Spanish.

Price : \$275

Please consider Valve Fundamentals if time constraints and cost are an issue. Contact us at 1-800-338-8158 or 641-754-3771, or by email for more information. Students will have email access to our Subject Matter Experts for the duration of their course subscription. Upon registration you will be sent the email address of these individuals. Any questions you have about the course material can be sent directly to them.



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Commercially Dedicated DVC6000 Digital Valve Controller Installation, Configuration and Troubleshooting

Course 1753N CEUs: 2.1

Overview

This Fisher Controls course is for Nuclear Power personnel who will install, configure, maintain, and troubleshoot the Commercially Dedicated DVC6000 Digital Valve Controller. This 3-day course uses lecture and hands-on workshops to teach students to properly mount, calibrate, configure, troubleshoot, and maintain the DVC6000 Digital Valve Controller (DVC). The class teaches students how to perform basic configuration tasks using the 375 Field Communicator. AMS ValveLink software is also taught, including the procedures and methods that are use to configure, run, and interpret various diagnostic tasks, including signatures, DEB tests, and Performance Diagnostics. Supporting routines such as Batch Runner, Event essenger, and other options will also be discussed. Those who complete this course will be able to:

- correctly mount an actuator to a control valve body
- mount the DVC6000 instrument on a sliding-stem or piston actuator
- install a Remote Mount digital valve controller
- run Setup Wizard methods
- calibrate travel and pressure sensors
- configure the digital valve controller for desired operation
- configure appropriate alerts
- collect good data for advanced diagnostics interpretation
- configure and run performance diagnostics

Prerequisites Valve Technician I (Course 1400) or equivalent (two years experience in valve and instrument operation and maintenance).

Topics

- Positioner Basics
- Actuator Mounting and Benchset
- 375 Field Communicator Operation
- Digital Valve Controller: Initial Setup, Remote Mount Setups, Configuration, Tuning Issues
- Sensor Calibration
- Configuring Detailed Setup Parameters
- AMS ValveLink Software Basics
- Device Monitoring

Topics Continued, Next Column

Commercially Dedicated DVC6000 Digital Valve Controller Installation, Configuration and Troubleshooting (Continued)

Course 1753N CEUs: 2.1

Topics Continued

- Gathering Good Data for Advanced Diagnostics
- Configuring and Running Performance Diagnostics
- Wiring Issues
- Basic Troubleshooting

Price \$2,050

Location Marshalltown, IA **Start Date 2012** Call to Schedule



Baumann Valve Technician

Course 1402 CEUs: 2.1

Overview

This 3-day 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. Students spend over 50% of their time in hands-on workshops. Several of the workshops will be lead by Baumann assemblers. Those who complete this course will be able to:

- correctly perform installation procedures
- perform basic troubleshooting
- properly apply and calibrate positioners and 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 Series
- 42000 Series
- 83000 & 84000 Sanitary Valves
- 21000 & 25000 Series Butterfly
- Low Flow and Specialty Valves
- Packing
- Bench Set
- Seat Leak Testing
- Actuators
- Positioners and Digital Valve Controllers

Price \$1,950

Location Marshalltown, IA **Start Date 2012** Call to Schedule