

# Control Valve Training

## Course Program



**FISHER™**



# Control Valves

# LEARNING PATH



At the foundation of any process are the field devices that measure and control the flow of air, steam, water, gas or hundreds of other materials. Without proper basic setup, calibration and configuration of these devices, advanced control techniques cannot provide the levels of efficiency the technology is capable of.

Knowledge of process control devices within a plant is often passed down from generation to generation. At the same time, if advances in process technology and methodology usually brought about by training aren't brought into the plant, in-house standards for device setup and maintenance can become based on out-dated theory. The result is that while a valve or instrument may be working, it may not be working up to its capabilities and is not delivering on its promised performance.

Educational Services has made a global commitment to helping our customers find and keep that promise of performance.

### **Regional Training Centre:**

Our regional training centres are strategically located to support your training needs when and where you need it. We can host factory certified training courses in Control Valve Engineering and Maintenance.

We utilise cutways and samples to provide course attendees with hands-on experience, one-on-one time with instructors, and a facility tour. Individuals can attend courses at any of our regional training centres or participate in one of the schools we conduct at a local sales or service office.

### **On-site, Local and Customised Training**

We offer on-site training subject to availability of dedicated classroom facilities and suitable workshop locations so we can maintain the same high standards of education at site. Our organization is available to work with you in defining the appropriate subject matter and right approach to satisfy your training needs. Each year individuals participate in classes tailored to their particular needs and conducted locally or at their plant.

Being able to develop customized courses for our customers; allow us to provide you with targeted training that really works for you.

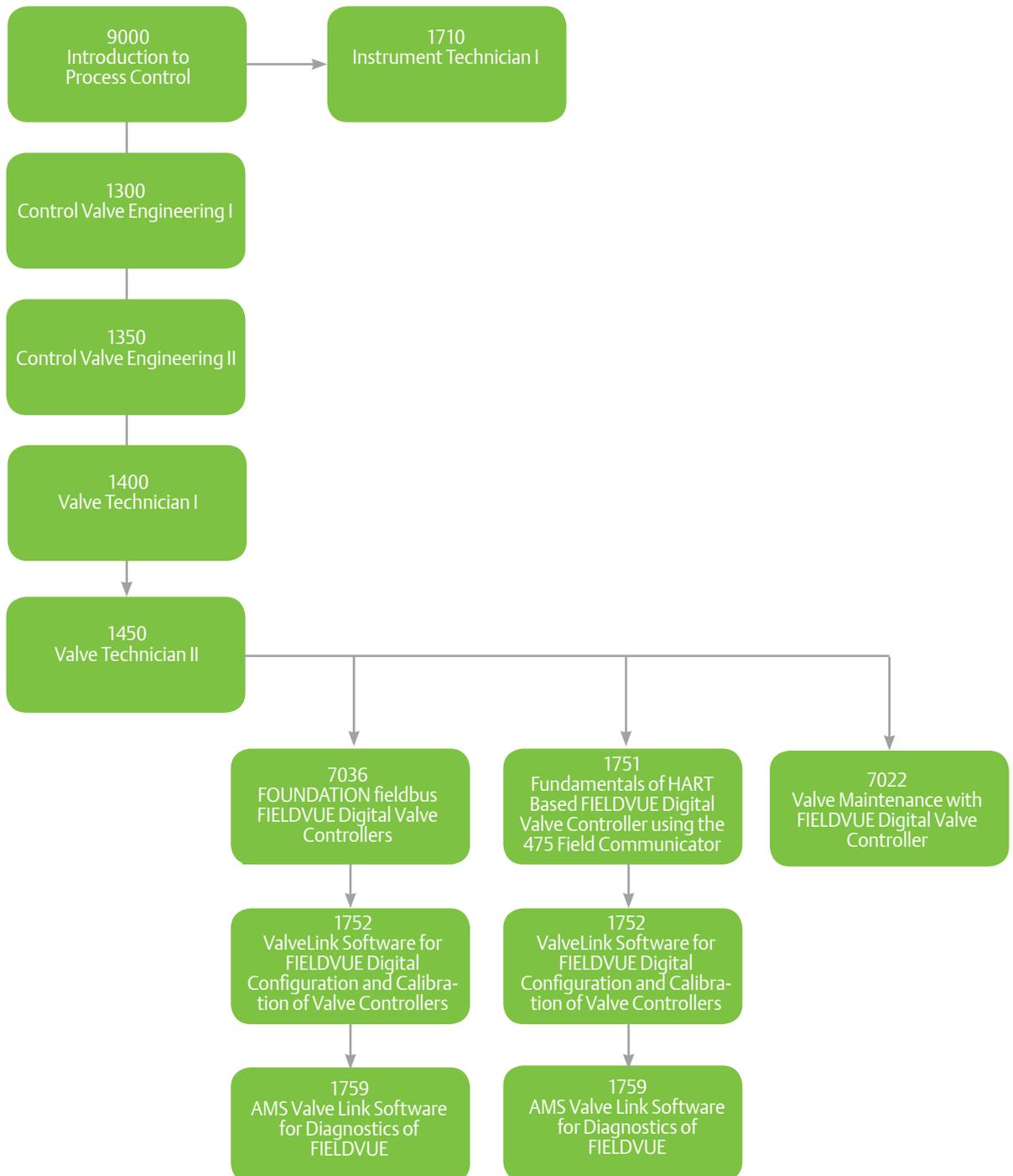
Consider on-site training if:

- You need to train several people at once
- You need training focused on a specific process or issue unique to your organization
- You're looking for an alternative to sending employees off-site, incurring expensive travel and lodging costs

# Control Valves LEARNING PATH

Vocational training covers the basics and fundamentals but if the plant personnel do receive hands on experience with the measurement products the initial knowledge begins to fade over time. Emerson has identified a series of learning paths to help close the gap in plant knowledge and to enhance the on-the-job skills that have been learnt over time.

## Valve Engineer



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 maintenance and operation.

## Introduction to Process Control

**Course: 9000 CEUs: 3.2**

### Overview

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

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

## Control Valve Engineering I

**Course: 1300 CEUs: 3.2**

### Overview

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

This 3 day 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 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 of 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**

### Overview

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

This 4 ½ day course reviews of 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 this course will :

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

### Prerequisites

Students should have completed the Control Valve Engineering I Course 1300 and worked on control valve sizing for at least 6 months after 1300 class. 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

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.

**Valve Technician I**

**Course: 1400 CEUs: 3.2**

**Overview**

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

This 4 ½ 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, and 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

**Valve Technician II**

**Course: 1450**

**Overview**

The 4 1/2 day course provides an expanded and holistic view of control valve performance objectives and issues. Topics cover a broad range of skill areas including valve and instrument selection, sizing, calibration, maintenance, operation, and troubleshooting. The broad range of performance-related topics is designed to help students improve their abilities to install, maintain, and operate control valves and related equipment in a manner that improves loop performance and valve life.

**Prerequisites**

Must have completed the Valve Technician I module (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

**Instrument Technician**

**Course: 1710 CEUs: 3.2**

**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.

- 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

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

Course: 1751 CEUs: 1.4

### Overview

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

This 2 day course provides the necessary skills to :

- Install and mount a 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

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

Course: 1752 CEUs: 1.8

### Overview

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.

This 2 ½ day 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 course 1451 / 1751

### 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 Diagnostic Data Interpretation

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

Course: 7022 CEUs: 2.1

### Overview

This course is designed to teach 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

The 3 day course delves into device specific techniques for commissioning , maintaining and troubleshooting Fisher FIELDVUE™ Instruments

### Prerequisites

None though a basic familiarity with Fisher FIELDVUE™ Instruments will be beneficial.

### 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 Controllers

**Course: 7036 CEUs: 2.1**

### Overview

This course teaches technicians and engineers the basics of FOUNDATION™ fieldbus digital valve controller installation, configuration, calibration, and troubleshooting using 475 Handheld and ValveLink™ Software

The 3 day course reviews of 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

Basic familiarity with positioners and control valve basics is required. Course 1400 / 1451 is recommended

### Topics

- Positioner Basics
- FOUNDATION™ Fieldbus Overview
- FIELDVUE™ digital valve controller Installation and Mounting
- Modes and Status
- Configuration and Calibration with new 475 Field Communicator
- ValveLink™ Setup Wizard / Detailed Setup
- Tuning
- Tag Management
- Pressure Control
- Valvelink™ Diagnostics
- FIELDVUE™ Instrument
- Troubleshooting

## AMS® ValveLink® and Diagnostics for FIELDVUE® Data Interpretations

**Course: 1759**

### Overview

The 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 AMS 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. Upon completion, students will be able to:

- Use and understand diagnostic terminology
- Interpret AMS 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 trouble-shoot problems in valve/actuator assemblies

### Prerequisites

Students must have completed Courses 1751 Fundamentals of FIELDVUE Digital Instruments and the 375 HART Communicator and 1752 Valve Diagnostics for FIELDVUE Operations prior to attending this school.

### Topics

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



[Registration form >>](#)

**FISHER™**



WPC instructors are accredited as Authorized Provider by the International Association for Continuing Education and Training ([IACET](#)).

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