

# Valve Automation Education Services





Emerson Process Management Valve Automation would like to partner with you in ensuring that your staff is utilizing our products and solutions in a way that will maximize your investment.

Having a skilled and knowledgeable workforce is a key factor in eliminating Health, Safety, and Environmental issues, meeting production and availability targets while operating your assets at optimal operating conditions. Partnering with Valve Automation for your training needs means that you will have industry experts training and transferring critical knowledge to your staff.

A strong training program and a good knowledge management system is critical to the long term success of any business. Partnering with Valve Automation will provide you with a sense of security that your staff has the knowledge to make your business successful.

Valve Automation Education Services offers training opportunities that will give you the knowledge required to get the maximum value out of your investment by:

1. Training your staff on the functionality and features of the actuator.
2. Training your staff on how an actuator works.
3. Training your staff on how to troubleshoot problems associated with the actuator.
4. Training your staff on how to maintain the actuator.

On the following pages are the courses offered by Valve Automation Educational Services. Our training courses are suitable for many of your staff including, but not limited to: Design Engineers, Process Engineers, Plant Engineers, Plant Operators, Field Technicians, Service Engineers/Technicians, and Maintenance Technicians.

Please visit [www.emersonprocess.com](http://www.emersonprocess.com) to find out more about our Educational Services program.



## Bettis Rack and Pinion and Scotch Yoke

### VA103: Bettis Rack and Pinion and Scotch Yoke Product Servicing

#### Overview

This 4-day class provides comprehensive information concerning the installation, operation, service and maintenance of Bettis products. Certificates are issued at completion of course.

#### Prerequisites

Involved with the service and/or maintenance of Bettis Actuators.

#### Topics

- Valve Automation Center Contract Review
- Installation/Maintenance Instruction Manuals
- Product Serial Numbers Review
- Service Procedure Index Review
- General Operating/Maintenance Instructions
- General Servicing Information on RPB, RPC, D, CB, CBA, CBA-300, CBB, HD, T and G-Series Actuators
- Conversion of Fail-Close Spring-Return RP, RPB, RPC, D, HD, T, G-Series Actuators to Fail-Open Spring-Return
- Field Service Work performed by VAC's
- Bettis Crossridge Procedure Review
- 4 Days of Practical Exercises Involving The Disassembly/Reassembling of Products
- Manufacturing Facility Tour

### VA104: Bettis Rack and Pinion and Scotch Yoke Products

#### Overview

This 5-day course provides an introduction to the range of pneumatic and hydraulic valve actuators manufactured by Bettis. In addition to discussing product features and benefits, students will be given a broad overview of the valve automation industry and provided with training on product selection and applications. Common pneumatic and hydraulic control components and systems will also be discussed including a review of competitive products. Certificates are issued at completion of course.

#### Prerequisites

Involved with the purchase, application, marketing or sales of products.

#### Topics

- D-Series Actuators Overview
- CBB-Series Actuators Overview
- CBA-300 Series Actuators Overview
- G-Series Actuators Overview
- Bettis Electronic Data Formats Overview
- Torque Mechanisms Overview
- Manual Overrides Overview
- Actuator Manual Sizing/Selection
- Introduction to Global Configuration Sizing Tool (GCS)
- Common Control Components/Control Systems
- Valve Mounting Hardware Overview
- Competitor Product Comparisons
- General Practical Work
- Manufacturing Facility Tour

## Bettis Nuclear Series

### VA114: Bettis Scotch Yoke Nuclear

#### Overview

This 5-day course includes 3 days of classroom training and 2 days of hands on training. The course provides an introduction to the range of nuclear pneumatic and hydraulic valve actuators manufactured by Bettis. In addition to discussing product features and benefits, students will be given a broad overview of the valve automation industry and provided with training on product selection and applications. Certificates are issued at completion of course.

#### Prerequisites

Participants must be a direct Emerson Process Management nuclear customer (authorized to sell our safety-related products) or an end user (nuclear power plant, etc.).

#### Topics

- Introduction and History
- Torque Mechanism Overview
- CB/CBA/CBB Series Actuators Overview
- CBA-300 Series Actuator Overview
- HD-Series Actuator Overview
- G-Series Actuator Overview
- Nuclear Series Overview
- Overrides
- Actuator vs. Valve
- Website Tour
- Service, Support, Warranty, Drawings, Parts and BOM's
- Hands-On Training CBB/CBA-300, HD, G, T-Series Actuators
- General Practical Work
- Manufacturing Facility Tour

**Note:** Models used during hands on training are similar to nuclear grade construction models



# Bettis EHO Electro-Hydraulic Operator

## VA115: Bettis EHO Electro-Hydraulic Operator Actuator Product Training

### Overview

This 1-day course provides an introduction to the Bettis EHO Electro-Hydraulic Operator. In addition to discussing product features and benefits, students will be given a broad overview of the valve automation industry and provided with training on product selection and applications. Common pneumatic and hydraulic control components and systems will also be discussed, and a review of competitive products. Certificates are issued at completion of course.

### Prerequisites

Involved with the purchase, application, marketing or sales of products.

### Topics

- Introduction
- Operating System
- Standard Product Specification
- Certificates
- Standard Electro-Hydraulic Operator Actuator Overview
- Bettis Electronic Data Formats Overview
- Operation – On/Off, ESD
- Operation – Hydraulic Manual Override
- Electro-Hydraulic Operator Construction
- Electro-Hydraulic Operator Components
- Hydraulic Power Module Overview
- Hydraulic Manifold Overview
- Wiring Harness
- Separate Terminal Chamber
- Key Features Video
- Applications
- Standard and Smart Versions
- Q & A
- Manufacturing Facility Tour



# EIM Product Training

## VA113: EIM Product Training

### Overview

This 4-day course provides students with a fundamental knowledge of the Series 2000 actuator. Attendees are presented with the basics of actuators and how they operate valves along with the basic components of actuators. Students will learn model number nomenclature, how to order parts, and control package wiring diagrams interpretation. Certificates are issued at completion of course.

### Prerequisites

Involved with the purchase, application, marketing or sales of products.

### Topics

- Introduction and Company History
- Product Overview
- EIM Manual Gear Actuators
- EIM Electric Actuators and Controls
- Networks - Controlinc
- HQ Actuator
- Multi-Port Actuator
- EIM Product Standards and Specifications
- Quality Assurance
- Service and Support
- Sizing and Selecting Actuators
- Manufacturing Facility Tour





## VA111: EIM Service Training

### Overview

This 3.5-day class presents the fundamental aspects of the Series 2000 actuator with TEC2, and M2CP controls. Attendees are presented with the basics of actuators and how they operate valves. Basic components and assemblies are studied through the actual disassembly and reassembly of the actuator. Each student will learn how to set travel limits, torque limits, and operate an actuator on multi-turn and part-turn valves. Model interpretation, how to order parts, control package wiring diagram interpretation and basic maintenance are all presented in a combination hands-on/instructor-led format. Any original course documentation and certificates are provided to all attendees for company records at the end of the program. Certificates are issued at completion of course.

### Prerequisites

Students interested in attending this program should have a background or equivalent work experience in basic mechanical and electrical practices and principles. No previous service experience is necessary.

### Topics

- Identify the basic components and assemblies of the Series 2000 actuator by function and operation
- Disassemble and reassemble a Series 2000 actuator with installed controls: multi-turn and part-turn valve
- Identify EIM control packages by function with the aid of a control wiring diagram
- Demonstrate the correct method to set position and torque limits: multi-turn and part-turn valve
- Demonstrate the operation of a modulating unit with the Digital Futronic controller
- Perform basic maintenance associated with the operation of an actuator
- Manufacturing Facility Tour



## EIM Advanced Service Training

### VA112: EIM Service Training

#### Overview

This 5-day class presents the fundamental overview of the construction, assembly, hardware, software and configuration of the Series 2000, 500, M2CP, and HQ actuators with TEC2 and M2CP controls. Students attending this program will demonstrate an ability to identify actuator hardware, components and assemblies. Students will interconnect various control configurations and prove actuator operation. Students will demonstrate the ability to setup, configure, check and verify operation of various actuator configurations using appropriate hardware or software. Any original course documentation and certificates are provided to all attendees for company records at the end of the program. Students must bring an up-to-date windows compatible laptop with XP or Windows 7 installed. An EIM service kit part number PRGM SVC KIT will be provided for each student to use and retain. Certificates are issued at completion of course.

#### Prerequisites

Students planning on attending this program should have a minimum of two years field service experience and have previously attended the Service Level 1 training program or proven competency authenticated by the local EIM Sales Manager or attendee's supervisor. Student must have a strong background in the mechanical operation of EIM products. Other attendees with a solid background in electrical controls (including microprocessor basics) are encouraged to attend. Attendees must also have a working knowledge of MS Windows.

#### Topics

- Introduction and company overview
- TEC2000, Model 500, M2CP and HQ
  - Identify the basic components and assemblies of the actuator by function, configuration and operation
  - Theory of operation
  - Identify module compatibility within the various configurations
  - Hands-on training
  - Customize the configuration
  - Troubleshoot start-up problems associated with installation, configuration and operation on various control and actuator combinations
  - Wiring options
  - Discuss diagnostics troubleshooting by application
  - Firmware upgrades
- TEC2 Retrofit
  - Identify components of a TEC2 retrofit kit
- Manufacturing Facility Tour

**Note:** There is a separate course detailing networks



### VA110: FieldQ Products

#### Overview

This 3-day class provides the knowledge required for the student to understand, troubleshoot and even repair the Valve Automation FieldQ actuator and modules. The class covers the full range of the actuators and the modules used to interface to the actuator. Classes are held periodically but can be tailored to fit specific needs of the students in attendance. Certificates are issued at completion of course.

#### Prerequisites

Students should be involved with the purchase, application, marketing, sales, or service/maintenance of the FieldQ Actuation System.

#### Topics

- Basic Product Overview
  - Actuator, Control Modules, Pneumatic Modules
- Introduction to Actuators
  - Rack and Pinion Operation, FieldQ Features/Benefits, Data Sheets
- Introduction to Modules
  - General Features and Benefits, Types, Construction, Functionality
  - Hands-on with Conventional, Smart, and Bus Modules
- Field Topics
  - Installation, Maintenance, and Troubleshooting
- Sales Training
  - Applications, Pricing, Configurations
- Manufacturing Facility Tour

**Note:** Training is set up to include hours of learning the FieldQ product family via hands-on activities. In fact, students will often spend more time learning in the lab than being lectured.





## Hytorch Product Training

### VA108: Hytorch Product Training

#### Overview

This 3-day class provides a solid grounding in Valve Automation solutions in general with detailed and specific information given on the range of actuators and control accessories available from Hytorch. Classes are tailored to fit specific student requirements. Certificates are issued at completion of course.

#### Prerequisites

Students should be involved with the purchase, application, marketing, sales or service/maintenance of Hytorch products.

#### Topics

- Overview of Hytorch
- Key Accounts and Markets
- Pneumatic Actuators, History, Theory and Different Types
- Comparison of Pneumatic Actuators to Electric, Hydraulic and Electro-Hydraulic Designs
- Advantages of the Rack and Pinion Design
- ISO Standards
- General Valve Automation Applications
- Hytorch Actuator Variations and Evolution
- Valve Automation Accessories Including Limit Switches, Solenoid Valves, Speed Control Valves and Valve Mounting Options
- Mounting of Control Accessories
- Hytorch Product Features and Benefits
- General Valve Types/Torque Characteristics
- Actuator Sizing Techniques, Test Questions
- Hytorch Actuator Sizing Program
- Hytorch Drawing Types and Procedures
- QA Systems, Functions, RMA's and Customer Complaint Handling
- Hytorch Product Warranties
- Price Book Review
- Hands-on Review of Competitive Products
- Selling and Marketing Techniques
- Hands-on Actuator Assembly, Disassembly, Mounting and End-Stop Adjustment
- Question and Answer Session
- Final Test
- Manufacturing Facility Tour



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