Pressure Process Control | Concepts, Measurement, & Operation

eLearning Course: M33308

Amatrol's Pressure Process Control interactive multimedia introduces how to control liquid level and tank pressure simultaneously using a human machine interface (HMI), programmable automation controller (PAC), and variable frequency drive (VFD). This knowledge will prepare learners for real-world industrial fields such as pharmaceutical, bio-technology, and power generation. Major topics include process control concepts, piping and instrumentation diagrams, final control elements, pressure measurement, HMI panel operation, process system alarms, performance concepts, and open- and closed-loop tuning.

Pressure Process Control

Amatrol's eLearning curriculum is unique in that it thoughtfully combines in-depth theoretical knowledge with practical, hands-on skills. This powerful combination of knowledge and skills solidifies understanding and creates a strong foundation for pursuing more advanced skills.

For example, the pressure process control eLearning course covers important topics, such as:

Introduction to Process Control
Learners begin with an introduction into process control, including process control concepts, safety, open and closed loop control, and manual control. Individual lessons focus on topics like common process control applications, 14 basic rules of process safety, difference between and open loop and closed-loop process control system, and functions of a manual control application. Learners will also practice skills, such as determining manipulated and controlled variables, performing a lockout of process control equipment, identifying components of a pressure process control system, and manual pressure control in a tank using open and closed-loop methods.

Learning Topics

Instrument Tags
Using Amatrol's instrument tags eLearning course, learners will study block diagrams, instrument tag

fundamentals, and interpreting instrument tags. Individual lessons focus on topics like function of a block diagram, six types of information described by an instrument tag, and how to properly read an instrument tag for a variety of manufacturing information. Learners will also practice skills, such as drawing a block diagram, identifying the type and location of a device using an instrument tag, and identifying the function of a device given its instrument tag.

Piping and Instrumentation Diagrams
Learners will study piping and instrumentation diagrams, including line symbols, valve and pump symbols, level and flow sensing elements, pressure and temperature sensing elements, and instrument index. Individual lessons focus on topics like function of a loop diagram and P&ID; valve and actuator symbols; liquid level, pressure and temperature sensing element symbols; and function of an instrument index. Learners will also practice skills, such as identifying P&ID line, valve and actuator symbols; drawing a P&ID given an actual process control system; and interpreting instrument data using an instrument index.

Final Control Elements
In this module, learners will study various aspects and components of final control elements, including pressure regulator valves, proportional control valves, pressure relief valves, pumps, and variable speed drives. Individual lessons focus on function and operation of a pressure regulator valve; two types of proportional valves; function and operation of a pressure relief valve; operation of a centrifugal pump; and two types of variable speed drives. Learners will also practice skills, such as connecting and operating a pressure regulator valve and an electric proportional valve; testing the operation of a pressure relief valve; connecting and operating a centrifugal pump; and manually controlling flow using a Variable Frequency Drive (VFD) and pump.

Pressure Measurement
Continuing through the pressure process control eLearning course, learners will study proper pressure measurement, including pressure measurement concepts, mechanical and electrical pressure sensors, pressure sensor sensitivity, and display scaling. Individual lessons focus on four types of pressure measurement, function of a pressure sensor, four types of electrical pressure sensors, importance of sensor sensitivity, and display scaling. Learners will also practice skills, such as connecting and operating a piezoelectric pressure sensor, converting pressure sensor output signals to pressure units, and scaling differential pressure level sensor displays.

Loop Control Devices
Learners will study loop control devices, including loop control parameters and manual operation. Individual lessons include two categories of loop controllers, basic functions of an electronic loop controller, five common loop controller parameter groups, and connecting a loop controller to a final control element. Learners will also practice skills, such as navigating HMI panel screens, viewing and changing loop control parameters using an HMI panel, and operating a loop control system in manual mode.

Pressure Control Systems
Using Amatrol’s pressure control systems eLearning course, learners will study on/off and closed-loop pressure controls; split-range and gas blanket pressure control systems; and process system alarms. Individual lessons focus on two types of automatic pressure control systems; operation of a closed-loop, split-range, and gas blanket pressure control system; and function of two types of alarms in a process control system. Learners will also practice skills, such as configuration and operation of an on/off, closed-loop, split-range, and gas blanket pressure control system; and configuration of an alarm in a process controller.

Methods of Automatic Control
In this module, learners will study various methods of automatic control, including performance concepts, proportional control, proportional-integral control, and proportional-integral-derivative control. Individual lessons focus on steady and transient control system states, proportional bands, integral (reset) controls, and proportional derivative control. Learners will also practice skills, such as using a controller to control proportional control, PI control, PD control, and PID control.

Control Loop Performance
Rounding out the pressure process control eLearning module, learners will study control loop performance, including resolution, accuracy and repeatability, and open-loop and closed-loop tuning. Individual lessons focus on control loop optimization, five methods of expressing accuracy, importance of repeatability, the process reaction curve open-loop method, and the ultimate gain closed-loop method. Learners will also practice skills, such as calculating resolution and instrument accuracy, and tuning a control loop using both the process reaction curve

method and the ultimate gain closed-loop method.

Address

Amatrol
2400 Centennial Blvd
Jeffersonville, IN 47130

Contacts

email: contact@amatrol.com
phone: (800) 264 8285