QUEST
Professional Center

PROFESSIONAL TRAINING COURSE

Course No. 1532

HVAC Controls & Building Automation Training Course

HVAC, REFRIGERATION & BUILDING SERVICES
INDUSTRIAL ENGINEERING, MAINTENANCE & OPERATIONS

DURATION
5 Days

DELIVERY
Classroom

LOCATION
Amsterdam, Netherlands

DATES
26 – 30 Oct 2026

Scheduled Event Details

CITY	Amsterdam, Netherlands
DATE	26 – 30 Oct 2026
DELIVERY TYPE	Classroom
COURSE FEE	€6,000

Course Overview

The HVAC Controls & Building Automation Training Course is a specialized professional program designed to develop advanced knowledge and practical skills in the control, automation, monitoring, and optimization of heating, ventilation, and air conditioning systems. The course focuses on modern control technologies used across commercial buildings, government facilities, hospitals, hotels, industrial facilities, and large-scale infrastructure, with particular emphasis on operational reliability, occupant comfort, energy efficiency, and effective facility management.

The program examines the engineering principles behind HVAC control systems, including sensors, controllers, control valves, actuators, thermostats, variable frequency drives, measurement devices, and control sequences. Participants will explore how these components interact to regulate temperature, pressure, humidity, airflow, chilled water systems, and other operating parameters. The course also explains how proper control strategies can improve system stability, reduce unnecessary equipment operation, and support more efficient facility performance.

A major component of the HVAC Controls & Building Automation Training Course is Building Management Systems and their application in centralized monitoring and control. Participants will examine system architecture, communication between field devices and controllers, alarm management, trend monitoring, scheduling, setpoint management, data logging, and centralized supervision. The course also addresses the integration of HVAC equipment with broader building automation strategies to create coordinated and responsive facility operations.

The course provides strong practical coverage of troubleshooting and maintenance. Participants will learn how to evaluate sensor signals, verify actuator and valve operation, review controller settings, analyze alarms, interpret operating data, and identify common control-system failures. This structured approach enables maintenance and engineering professionals to investigate performance problems systematically and develop appropriate corrective actions.

The HVAC Controls & Building Automation Training Course connects engineering design, commissioning, operation, maintenance, energy management, and continuous improvement. Through practical exercises and workplace-oriented case studies, participants will be better prepared to evaluate existing control systems, identify improvement opportunities, optimize HVAC performance, and support reliable and energy-conscious building operations.

Objectives

- Analyze the fundamental principles of automatic control applied to HVAC systems during the training program.
- Evaluate the functions and performance requirements of sensors, controllers, control valves, actuators, and related control components.
- Apply appropriate control principles for temperature, pressure, humidity, airflow, chilled water, and other HVAC operating parameters.
- Analyze HVAC operating sequences and determine the relationship between control signals, setpoints, and equipment response.
- Evaluate Building Management System architecture and its role in centralized HVAC monitoring and control.
- Design a basic HVAC control concept based on building requirements, equipment characteristics, and operational objectives.
- Apply scheduling, setpoint management, alarm handling, and load-control strategies to improve system operation.
- Analyze operating data, alarms, trends, and sensor readings to identify performance issues.
- Diagnose common faults affecting sensors, actuators, valves, controllers, and communication networks.
- Evaluate opportunities to improve HVAC energy efficiency through appropriate control strategies and automation.
- Develop practical procedures for improving control-system operation, maintenance, monitoring, and reliability.
- Prepare an initial improvement plan for upgrading or optimizing HVAC controls and building automation systems.

Who Should Attend

This course is designed for engineers, technicians, supervisors, and professionals involved in HVAC engineering, mechanical and electrical engineering, automation and control, facility operations, maintenance, and energy management. It is particularly relevant to HVAC engineers, mechanical engineers, electrical engineers, control and automation engineers, commissioning engineers, maintenance engineers, facility engineers, HVAC technicians, controls technicians, and operations and maintenance supervisors.

The course is also suitable for engineering and maintenance managers, facility managers, energy managers, project managers, building-services consultants, design engineers, commissioning specialists, and professionals responsible for Building Management Systems. It is valuable for personnel working with contractors, facilities management organizations, operation and maintenance companies, and technical service providers who need to evaluate HVAC controls and automation solutions.

The program is also relevant to professionals responsible for energy performance, building-system optimization, technical procurement, project delivery, maintenance planning, and the modernization of existing facilities. Managers and decision makers can benefit from the course by gaining a stronger understanding of how HVAC controls and building automation contribute to operational performance, energy management, equipment reliability, and long-term facility efficiency.

Learning Outcomes

- Explain the fundamental principles of HVAC control systems and building automation.
- Identify the functions of sensors, controllers, actuators, control valves, thermostats, and variable frequency drives.
- Interpret temperature, pressure, humidity, airflow, and other HVAC measurement and control signals.
- Analyze HVAC operating sequences and their relationship to setpoints and control commands.
- Read and interpret basic HVAC control diagrams and building automation system architecture.
- Evaluate the performance and reliability of sensors, actuators, valves, controllers, and field devices.
- Apply fundamental Building Management System monitoring and control functions.

- Analyze alarms, trends, historical data, and operating parameters to identify abnormal conditions.
- Diagnose common HVAC control-system faults and determine appropriate corrective actions.
- Evaluate opportunities to improve HVAC energy performance through automation and control optimization.
- Develop practical procedures for control-system maintenance, monitoring, and performance verification.
- Prepare an improvement plan for an HVAC control and building automation system based on facility requirements.

Course Outline

DAY 01

HVAC Controls Fundamentals and Control Principles

- Fundamentals of heating, ventilation, and air conditioning systems and their relationship with control systems.
- Principles of automatic control and its applications in HVAC.
- Types of HVAC control systems and levels of building control.
- Temperature, pressure, humidity, airflow, and differential-pressure sensors.
- Controllers, input and output signals, and basic control logic.
- Control valves, actuators, dampers, and variable frequency drives.
- Setpoints, operating ranges, deadbands, and system response.
- Control of fans, pumps, compressors, air handling units, and other HVAC equipment.
- Start-up, shutdown, interlocks, and equipment protection sequences.

> **PRACTICAL APPLICATION**
> Analyze a typical HVAC control system and identify the function of each major component.

DAY 02

HVAC Control System Design and Application

- Fundamentals of designing control systems for HVAC equipment.
- Identification of measurement and control points based on system requirements.

DAY 02 — CONTINUED

- Development and interpretation of basic HVAC control diagrams.
- Temperature and humidity control strategies.
- Control of air handling units and ventilation systems.
- Control of fans, pumps, chilled water systems, and related equipment.
- Control valves, dampers, airflow regulation, and water-flow control.
- Variable-load control strategies and demand-based operation.
- Scheduling, setpoint adjustment, and operating-mode management.

PRACTICAL APPLICATION

Develop a basic control concept for an HVAC system serving a representative building.

DAY 03

Building Management Systems and Building Automation

- Building Management Systems and their primary functions.
- Building automation architecture and levels of monitoring and control.
- Integration of HVAC systems with Building Management Systems.
- Communication between sensors, field devices, controllers, and supervisory systems.
- Operating data collection, trend analysis, and historical data management.
- Alarm management, notifications, and abnormal-condition monitoring.
- Centralized monitoring of HVAC equipment and building services.
- Development of monitoring screens and equipment status displays.
- Scheduling and setpoint management through building automation systems.

PRACTICAL APPLICATION

Evaluate a Building Management System and assess its monitoring and control capabilities.

DAY 04

Troubleshooting, Maintenance, and Control-System Performance

- Systematic approaches to troubleshooting HVAC control and automation systems.
- Inspection and verification of sensor accuracy and signal quality.
- Diagnosis of control valve, actuator, damper, and controller faults.
- Analysis of controller input and output signals.
- Interpretation of alarms, fault codes, operating trends, and event logs.
- Diagnosis of communication problems between automation-system components.
- Troubleshooting temperature instability and poor HVAC response.
- Preventive maintenance requirements for control systems and measurement devices.
- Verification of setpoints, control sequences, interlocks, and operating parameters.

> **PRACTICAL APPLICATION**
>
> Analyze control-system fault scenarios, identify root causes, and determine corrective actions.

DAY 05

Energy Efficiency, Performance Management, and Continuous Improvement

- The role of HVAC controls and automation in improving energy efficiency.
- Demand-based control and reduction of unnecessary equipment operation.
- Optimization of fans, pumps, air handling units, and cooling equipment.
- Monitoring energy consumption and correlating energy data with operating conditions.
- HVAC and building automation performance indicators.
- Using Building Management System data to support operational decision-making.
- Optimization of setpoints, schedules, and operating modes.
- Development of control-system maintenance and performance-monitoring strategies.
- Assessment of opportunities for upgrading and modernizing existing control systems.
- Integrated case study: Evaluate the performance of an existing HVAC control and building automation system.

DAY 05 — CONTINUED

FINAL WORKSHOP

Develop a practical improvement plan for HVAC controls and building automation linked to measurable operational objectives.

Register or Request More Information

Course page: https://quest-training.com/courses/hvac-controls-building-automation-training-course
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