

HVAC Design, Commissioning and Maintenance Training Course

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Overview

HVAC Design, Commissioning and Maintenance Training Course is a one-week advanced course for HVAC, facilities, and building-services teams who leave with an HVAC Design-to-Operations Decision Pack. The course connects design intent, load assumptions, psychrometrics, equipment selection, distribution, controls, commissioning, operating evidence, troubleshooting, maintenance, energy performance, and reliability. Agile Leaders Training Center delivers this course on HVAC design, commissioning, and maintenance.

Who Should Attend

- Teams responsible for HVAC design review, load assumptions, equipment selection, and specifications
- Functions responsible for commissioning, testing, adjusting, balancing, acceptance, and handover
- Teams responsible for HVAC operations, controls, trends, alarms, and performance verification
- Functions responsible for preventive maintenance, condition assessment, troubleshooting, and reliability
- Teams responsible for energy, indoor environmental quality, service continuity, and lifecycle decisions

The course assumes participants work with HVAC drawings, schedules, operating data, or maintenance records and leaves out software programming, refrigerant handling certification, detailed code compliance design, and live intrusive work.

Departments and Industries

The course supports HVAC lifecycle decisions across commercial, industrial, institutional, healthcare, hospitality, and infrastructure facilities.

- Mechanical engineering, building services, facilities, maintenance, and commissioning
- Commercial property, workplaces, retail, hospitality, and mixed-use buildings
- Manufacturing, food processing, laboratories, warehouses, and data facilities
- Healthcare, education, cultural facilities, and public buildings
- Energy, sustainability, technical assurance, and capital-project functions

Learning Objectives

By the end of this course, participants will be able to:

- Analyze HVAC design intent, loads, psychrometrics, and system choices.
- Evaluate equipment, distribution, controls, and operating sequences.
- Apply testing, adjusting, balancing, commissioning, and acceptance methods.
- Diagnose performance gaps using trends, alarms, measurements, and fault trees.
- Build preventive, condition-based, energy, and reliability actions.
- Build an HVAC Design-to-Operations Decision Pack.

Course Agenda

Day 1: Establish Design Intent

- Owner Requirement, Basis of Design, Load, Schedule, and Assumption Register
- Psychrometric Process, Sensible Load, Latent Load, and Design-Point Chart
- System Type, Zone, Diversity, Ventilation, Comfort, and Risk Selection Matrix
- Chiller, Boiler, Heat Pump, AHU, FCU, and Terminal Equipment Schedule
- Design Review, Maintainability, Access, Metering, and Commissioning Checklist

Day 2: Coordinate Distribution and Controls

- Airflow, Duct, Pressure, Fan, Terminal, and Leakage Calculation Sheet
- Water Flow, Pipe, Pump, Valve, Coil, and Hydronic Balance Model
- Control Point, Sensor, Actuator, Setpoint, Reset, and Alarm Register
- Occupied, Unoccupied, Startup, Shutdown, Economizer, and Safety Sequence Map
- Building Management System Trend, Interval, Retention, and Evidence Plan

Day 3: Commission and Accept Performance

- Pre-Functional Checklist, Deficiency, Owner, Due Date, and Closure Log
- Testing, Adjusting, and Balancing Air-and-Water Verification Sheet
- Functional Performance Test, Mode, Command, Response, and Acceptance Script
- Owner Requirement, Design Intent, Installation, Operation, and Evidence Traceability Matrix
- Systems Manual, Training, Handover, Warranty, and Ongoing Commissioning Plan

Day 4: Operate, Diagnose, and Maintain

- Temperature, Humidity, Pressure, Flow, Energy, and Indoor-Condition Dashboard
- Symptom, Trend, Alarm, Cause, Test, and Corrective-Action Fault Tree
- ASHRAE Standard 180 Inspection, Maintenance Task, Frequency, and Record Matrix
- Filter, Coil, Fan, Pump, Valve, Damper, Sensor, and Control Condition Card
- Energy Drift, Simultaneous Heating-Cooling, Setpoint, Schedule, and Reset Review

Day 5: Practice HVAC Lifecycle Decisions

- Exercise: Review Loads, Psychrometrics, System Choice, and Equipment Schedule
- Exercise: Diagnose Air, Water, Control, and Sequence Performance Gaps
- Exercise: Run a Functional Test and Close a Commissioning Deficiency
- Exercise: Prioritize Maintenance, Energy, Reliability, and Indoor-Condition Actions
- Capstone Exercise: Build the HVAC Design-to-Operations Decision Pack

Practical Exercises

The course uses suggested activities to connect design, commissioning, operating, and maintenance evidence with decisions.

- Suggested activity: test a design basis against loads, psychrometric states, equipment schedules, access, controls, and metering.
- Suggested activity: compare airflow, water-flow, sensor, setpoint, sequence, trend, and acceptance evidence.
- Suggested activity: isolate an HVAC performance gap using symptoms, trends, alarms, measurements, and a fault tree.
- Suggested activity: prioritize maintenance, commissioning, energy, reliability, ownership, and verification actions.

FAQs

Who should attend HVAC design, commissioning, and maintenance training?

HVAC design, commissioning, and maintenance training suits experienced engineering, facilities, commissioning, operations, and maintenance teams and assumes work with drawings, equipment schedules, operating data, or maintenance records.

How does HVAC design-to-operations training differ from basic HVAC maintenance training?

HVAC design-to-operations training connects design intent, system selection, distribution, controls, commissioning, operation, troubleshooting, and maintenance, while basic HVAC maintenance training focuses on routine equipment tasks and foundational fault checks.

How are HVAC commissioning results verified?

HVAC commissioning results are verified through requirements, design evidence, pre-functional checks, testing and balancing, functional tests, deficiency closure, acceptance criteria, systems manuals, training, and ongoing-performance records.

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What belongs in an HVAC Design-to-Operations Decision Pack?

An HVAC Design-to-Operations Decision Pack contains design assumptions, system and equipment choices, distribution and control evidence, commissioning results, operating trends, fault findings, maintenance actions, performance measures, owners, and review points.

Conclusion

Participants take back an HVAC Design-to-Operations Decision Pack. The pack connects design intent, system choices, distribution, controls, commissioning, operation, diagnosis, maintenance, energy, indoor conditions, reliability, and ownership. It changes fragmented project and facility evidence into a traceable lifecycle decision path with tests, acceptance criteria, actions, and review points.

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