HVAC A110: PNEUMATIC CONTROLS

Item	Value
Curriculum Committee Approval Date	12/02/2020
Top Code	094600 - Environmental Control Technology
Units	3 Total Units
Hours	72 Total Hours (Lecture Hours 45; Lab Hours 27)
Total Outside of Class Hours	0
Course Credit Status	Credit: Degree Applicable (D)
Material Fee	No
Basic Skills	Not Basic Skills (N)
Repeatable	No
Grading Policy	Standard Letter (S), • Pass/No Pass (B)

Course Description

Students will operate, maintain, diagnose and repair basic pneumatic controls from installation to service requirements. PREREQUISITE: HVAC A100 and HVAC A101. Transfer Credit: CSU.

Course Level Student Learning Outcome(s)

1. Operate and maintain basic pneumatic controls.
2. Troubleshoot pneumatic controls and perform basic maintenance.
3. Draw a system schematic for peripherals and controls.

Course Objectives

- 1. Describe direct and reverse acting controls.
- 2. Explain pneumatic control air compressors, filters, air driers, and sizing considerations.
- 3. Understand the operation of valves and actuators, including sizing and application.
- 4. Discuss thermostat types and application.
- 5. Describe the purpose and operation of high signal selector relays, low signal selector relays, high-low selector relays, applications and piping.
- 6. Explain economized controls and enthalpy control applications.

Lecture Content

Types of Control Systems Fundamentals of heating and air conditioning HVAC system Pneumatic Controller Principles Temperature pressure relationship Proportional control patterns Sensing elements Amplifier feedback circuits Types of Controllers Thermostats Humidistats Receiver controllers master/submaster relationships System Peripherals Transmitters Relays Control devices valves motors Swithes electric pneumatic pneumatic electric position Pressure reducing valves Restrictors Instrument Air Systems Compressor Filter dryer Control applications Chilled water loop Boiler loop One pipe vs. multiple pipes Package units Humidifying Preventive maintenance Supply air systems Control calibration Damper, valves HVAC operation Scheduler Energy management Lock outs Economizer systems Psychometric factors Controller reset Computer control interface

Lab Content

See Course Content.

Method(s) of Instruction

- Lecture (02)
- Lab (04)

Instructional Techniques

Lecture, demonstrations, and hands on lab activities.

Reading Assignments

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Writing Assignments

Written description of pneumatic systems and components, and hands on identification of all parts of a pneumatics system.

Out-of-class Assignments

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Demonstration of Critical Thinking

Written testing comprised of multiple choice, true/false, fill in the blanks and hands on demonstrations of the equipment.

Required Writing, Problem Solving, Skills Demonstration

Written description of pneumatic systems and components, and hands on identification of all parts of a pneumatics system.

Eligible Disciplines

Air conditioning, refrigeration, heating (solar energy technician): Any bachelors degree and two years of professional experience, or any associate degree and six years of professional experience. Air conditioning, refrigeration, heating (solar energy technician): Any bachelors degree and two years of professional experience, or any associate degree and six years of professional experience.

Textbooks Resources

1. Required Whitman, Johnson, Tomczyk. Refrigeration and Air Conditioning Technology, 6th ed. Delmar Learning/Cenage, 0 Rationale: latest