

# Refrigeration and HVAC Operating Technician

## Qualifications

Minimum age - Adult

Education - High School Diploma, GED or equivalent

Experience - Two years or AS Degree Air Conditioning and hold EPA CFC License

Examination - Written (Oral or Practical when necessary)

Maximum Prime Mover Horsepower (Unsupervised) - unlimited

Maximum Refrigeration or Air Conditioning (Unsupervised) unlimited

## Curriculum at the Minimum

- First Law Of Thermodynamics
- Second Law Of Thermodynamics
- Heat Transfer Theory
- Principles Of Heat And Temperature Measurement
- States Of Matter
- British Thermal Unit
- Specific Heat, Sensible Heat, Latent Heat & Superheat
- Gas Laws
- Pressure
- Compression Refrigeration Cycle
- Refrigerants And Refrigerant Oils, Refrigerant Safety, Refrigerant Types, New Azeotropic Refrigerants, Including R-410A, Section 608 Clean Air Act
- Refrigeration System Components  
Evaporators, Compressors, Condensers, Metering (Expansion) Devices
- Refrigeration System Accessories  
Three Position Service Valve, Schraeder Port, Receiver, Filter-Drier, Sight Glass With Moisture Indicator, Suction Accumulator, Crankcase Heater, Crankcase Pressure Regulator, Evaporator Pressure Regulator.
- Air Conditioning (Comfort Cooling) System  
Package Systems, Packaged Terminal (Pt Ac) Units, Rooftop Units, Unitary Systems Line Sets, Refrigerant Piping, Determining System Charging Requirements, Heat Pump Systems, Air-Source, Water-Source, Ground-Source, Supplemental Heating And Cooling.
- Refrigeration Systems  
Commercial Refrigeration Systems, Refrigerated Display And Storage, Frozen Display And Storage, Refrigerated Air Dryers, Ice-Making Equipment And Ice Cream Making Equipment
- Psychometrics (Study Of Air – The Soul of Air Conditioning)
- HVAC Electrical Fundamentals  
Electrical Safety, Power Calculation, Power Factor, Electrical Circuits
- Electrical Components of ACR Systems  
Wiring, Circuit Protective Devices, Fuses, Circuit Breakers, Component Protective Devices, Overloads, Control Devices, Motors, and Transformers
- Troubleshooting ACR Electrical Systems  
Personal Protective Equipment, Lockout-Tagout Practices, Meter Categories, Test Procedures, Electrical Diagrams, Schematic (Ladder)

## Diagrams, Pictorial Diagrams and Installation Diagrams

- ACR System Service System  
Baselining, Data Collection, Service Equipment and Practices, System Start-Up, Preoperational And Operational Checks, Preventive Maintenance and Mechanical Troubleshooting
- Computer Word Document Processing and Spreadsheet Usage
- Water Treatment Theory, Operation and Control
- HVAC System Controls, Technology and Controller Action
- Equipment Protection
- System-Level Control
- System Optimization
- Sequences of Operation
- Selection of Controlled Devices
- Building Management
- Responding to Comfort Complaints
- Time-of-Day Scheduling
- Centralized Alarms and Diagnostics
- Remote Access
- Preventive Maintenance
- Reports
- Integration With Other Systems