

Call 1-877-978-7246



# UNDERSTANDING AIR CONDITIONING & REFRIGERATION™ SYSTEMS

Day 1 - Principles, Components & Systems

Day 2 - Troubleshooting, Maintenance & Operating Efficiency

Specifically Designed for Maintenance Personnel in Plants,  
Facilities and Commercial Buildings

“ This class by far achieved and exceeded my expectation

— Jason C., Facility Manager



- Reserve your space now either online or by calling us at 1-877-978-7246!
- Check us out online at [live.tpctraining.com](http://live.tpctraining.com) for a complete list of all virtual and in-person seminars.
- This seminar is also available for Virtual or In-Person Private Group Training

## Learning Objectives:

- Requirements of OSHA & NFPA 70E<sup>®</sup> standards
- Fundamentals of air conditioning & refrigeration
- Identification of components in AC&R systems and what they do
- Differences, types, and classifications of refrigerants & oils
- How to accurately read system & component measurements
- Air properties and their effect on the AC&R system
- How to work safely with AC&R systems & refrigerants
- What licensing & certification is required/not required
- How to operate an AC&R system from top to bottom
- How to conduct preventative & repair maintenance activities
- How to troubleshoot and service AC&R systems
- The role of energy conservation
- Applicable regulatory considerations
- How to become EPA 608 certified for handling refrigerants



## SEMINAR OVERVIEW

The goal of this two-day Air Conditioning and Refrigeration course is to provide a broad introduction to air conditioning and refrigeration systems, including everyday operation & important refrigerant safety practices.

Students are taught common practices (and some “tricks-of-the-trade”) for general operation and maintenance of their AC&R systems. They will learn about maintenance schedules and servicing, system diagnostics, troubleshooting, and fine-tuning to gain maximum efficiency. The course also covers an introduction to commercial and industrial chillers, regulatory laws and energy conservation.

## WHAT YOU WILL TAKE HOME

- A laminated, full-color TPC Training Reference Guide detailing all the “must-know” information covered in the class. Keep this with you while on the job for immediate knowledge recall.
- Comprehensive classroom materials
- A Personalized Training Certificate with 0.8 TPC Training Continuing Education Units for each day attended, 1.6 for both days.
- All the information you need from asking our instructors specific questions about your own unique equipment or facility.

## FREE EPA CERTIFICATION TESTING

Testing for EPA section 608 certification is optional. Section 608 of the Federal Clean Air Act requires that all persons who maintain, service, repair, or dispose of appliances that contain regulated refrigerants be certified in proper refrigerant handling techniques by passing the EPA 608 Technician Certification exam. While we cover material relevant to the test and make every attempt to help our students pass this exam, we cannot guarantee individual success. We recommended that students who want to take the test attend both days and plan time to study beforehand.

## CONTINUING EDUCATION

Upon completion of this seminar, the student will receive a Certification of Completion and .8 TPC Training CEUs per day attended. Most employers and many government agencies accept TPC Training CEUs to fulfill their continuing education requirements. If the student needs CEUs to renew a state license, please contact us at 303-867-5039 to ensure the state licensing board has approved the seminar. If we are currently not approved by your state licensing board, we are happy to begin the process as long as we receive your request at least one month before the training date.

## DISCUSSION TOPICS

Fundamentals of AC&R

- Air Conditioning versus Refrigeration
- Laws of Thermodynamics and Heat Transfer
- Regulation, Codes and Standards
- New Energy Efficiency Standards (S.E.E.R.)
- EPA Section 608 of the Clean Air Act
- ASHRAE, ASME
- Technician Licensing, Testing and Certification

### Compression Refrigeration Cycle

- Saturation, Superheat, and Subcool
- Basic System Design
- Follow-the-Heat™
- Refrigerants
- CFCs, HCFCs, HFCs, Inorganics
- Zeotropic and Azeotropic Refrigerant Mixtures
- Refrigerant Safety Including R-410a

### Refrigerant Oils

- MO, AB, POE, PAG, PAO Oils and Properties
- Maintaining Oil Quality in Your AC&R System

### Major AC&R System Components

- Evaporator
- Compressor
- Condenser
- Metering (Expansion) Device

### Auxiliary System Components

- Crankcase Heater
- Suction Accumulator
- Receiver
- Filter-Drier
- Sight Glass with Moisture Indicator
- Oil Separator
- Service Valves
- Muffler
- Refrigerant Controls

### Refrigeration Systems

- Air, Water, and Ground-Source Heat Pumps
- Commercial Refrigeration
- Other specialty refrigeration systems

### System Diagnostics, Servicing and Troubleshooting

- Service Tools and Equipment
- Manifold Gauge Set
- Recovery Machine
- Vacuum Pump
- Micron Gauge
- Leak Detection Equipment
- Recovering Refrigerant
- Charging the AC&R System
- Diagnosis, Common Failures, and Remedies
- Energy Conservation and Operating Efficiency

## JOIN OUR CLASSROOM SEMINARS FROM VIRTUALLY ANYWHERE

Our virtual instructor-led training option allows students to connect to a live classroom seminar via a web link, with the ability to participate full in the classroom dialogue, exercises, and Q&A. Online participants get all the benefits of the full classroom experience, plus the convenience of remote access.

### Features include

- Two full days of live, interactive instruction from a TPC Training instructor
- All classroom materials in PDF format
- Certificate of completion for 16 hours of live training
- Full technical support to ensure your online experience is a rewarding one

## SEMINAR FEE & AGENDA

This 2-day course is just \$1195 (Earn 1.6 CEUs)

|                 |                     |
|-----------------|---------------------|
| 7:30 am         | Registration        |
| 8:00 am         | Class Begins        |
| 12:00 - 1:00 pm | Lunch (on your own) |
| 4:30 pm         | Class Ends          |

## NO RISK REGISTRATION & MONEY-BACK GUARANTEE

You can reserve your space in the class at any time and cancel without penalty. Cancellations made more than 14 days prior to the seminar may be refunded or rescheduled. Cancellations made within 14 days may be rescheduled for any future topic and/or date. If you're not satisfied with the course, we'll promptly refund your payment.

## BRING THE TRAINING TO YOUR FACILITY VIRTUALLY OR IN-PERSON

Every public seminar class in our Course Catalog can be conducted virtually or on-site at your facility, with the same expert instructors. To arrange an in-person private group training, call or email us at [virtual@tpctraining.com](mailto:virtual@tpctraining.com).

### Some Advantages of In-Person Private Group Training

- Cost Savings — Save time and travel costs by keeping workers on-site
- Customized Content — Tailor the seminar to your facility and equipment
- Flexibility — Accommodate multiple shifts and different start and end times