

RSES
**TRAINING/
CERTIFICATION**
for Every HVACR
Career Stage



Since 1933, Refrigeration Service Engineers Society (RSES) has been a leader in training and education for professional HVACR technicians and contractors.

RSES was launched in an era when the small commercial and domestic refrigeration industry was in its infancy. At that time the only training available was through the factory and it typically lasted three or four weeks. Those who completed the factory training were now considered a "factory-trained expert." The majority of work was conducted by product dealers, distributors, or factory service departments. As more installations were done the need for independent service operators increased and the need for collecting, distributing, and exchanging ideas and information became paramount. It was through the untiring efforts of these independent service operators that RSES was born.

Though the scope and range of the industry has grown exponentially since then, RSES has remained dedicated to delivering technical information to HVACR professionals under a single vision and mission

Vision Statement: To be the definitive industry leader in all segments of the HVACR industry by providing superior educational training.

Mission Statement: To provide opportunities for enhanced technical competence by offering comprehensive, cutting-edge education and certification to our members and the HVACR industry. To advance the professionalism and proficiency of our industry through alliances with other HVACR associations.

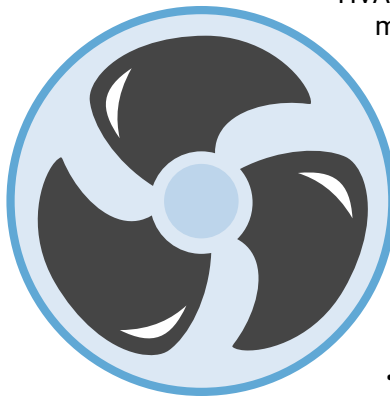
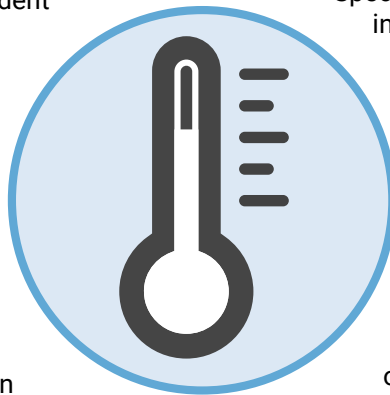
RSES, a 501(c)(6) membership organization with members in chapters in the U.S. and Canada, with additional technicians routinely using its training material in 50 countries across six continents.

REASONS TO JOIN RSES

Despite the name, Refrigeration Service Engineers Society, RSES provides more than refrigeration training, as it

has evolved into education for all aspects of the HVACR industry. More importantly, RSES provides:

- **Comprehensive Training**—Specialized HVACR training and education is the #1 reason individuals join RSES. In-depth courses available include Heating, Refrigeration and Air Conditioning, Electricity, Controls, Heat Pumps, and more.
- **Relevant Education**
 - RSES offers continuous training opportunities for contractors, technicians and facility managers from students through to Certificate Member Specialist (CMS) Members both online and at in-person, networking events.
 - RSES Chapter and Regional Association seminars are held year-round in various cities across North America.
- **Valuable Certification Training**—Get the training required to earn certification—the high standards of your work will become widely respected and recognized.
- **Timely Information**—*RSES Journal*, the official magazine of RSES, is the industry's leading source for technical information that HVACR contractors, technicians and facility managers can apply on the job.
- **Valuable Benefits**—RSES has negotiated reduced rates on a wide selection of goods and services and is able to pass these benefits on to members and their families.
- **Local/Regional Training Access**—Local Chapters and Regional Associations offer educational resources in the form of either classroom or self-study training.
- **Direct Access**—The value of your membership extends to the digital presence of RSES. As an RSES Member, you'll have exclusive online access to any important features not available to non-members.



Due to the pressures of servicing advanced equipment and satisfying demanding customers, continuing education is mandatory for succeeding in today's industry. Consumers want quality, yet are increasingly cost-conscious. They demand excellent service, competitive prices, and want to know exactly what it will take to get the job done effectively and efficiently.

WHAT RSES PROVIDES MEMBERS

1. Comprehensive Training and Certification

Specialized HVACR training/education is the No. 1 reason individuals join RSES. The association publishes in-depth courses in Heating, Refrigeration and Air Conditioning, Electricity, Controls, Heat Pumps, Hydrocarbon Safety, NATE Certification Preparation and more. RSES training helps reduce callbacks; improve diagnostic and troubleshooting Skills; offers tips for working and communicating with customers and the general public; features action plans to improve efficiency; and provides safety guidelines. Basic through advanced levels of training are available to serve all levels of professionals.

In addition to its publications, RSES also offers continuing education opportunities through CEH Corner, webinars, seminars, local Chapter meetings and classes, as well as online training with numerous courses available through the HVACR Learning Network.

Certifications include RSES SM/CM/CMS; EPA Section 608; Hydrocarbon; Low-GWP (A2Ls); R-410A; North American Technician Excellence (NATE), California Title 24 and more.

2. Timely Information and In-depth Technical Resources

RSES provides timely, reliable access to information important to the HVACR profession.

RSES Journal, the official magazine of RSES, is a peer-reviewed publication that keeps everyone interested in the HVACR profession up to date through a wide variety of feature articles and news of the profession. Members also can access the digital edition archives of *RSES Journal*, as well as PDF versions of the technical articles and columns published since December 1995.

The RSES Service Application Manual (SAM) is available online at no charge to Members and contains thousands of pages of technical data, equipment analyses and evaluations, field application instruction, regulations, good practice codes, business development guidance and more. New chapters are added periodically.

3. Webinars

Improve skills and earn CEHs with the live RSES Webinar Series, designed to augment RSES's many other in-depth training programs. Free to Members, RSES webinars feature industry experts presenting on a variety of topics.

Webinars archived since April 2013 are available to view at no charge under the Members-only section of the website. Looking to earn a CEH from a past webinar? Members and non-members can visit the HVACR Learning Network to purchase a webinar and take a 10-question quiz to earn 1 CEH. Members received a discounted rate of \$10 per webinar (non-member rate is \$50).

4. Networking/Volunteer Opportunities

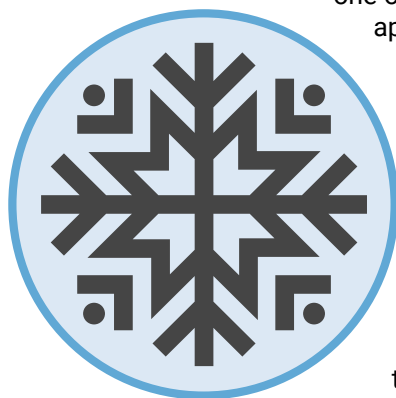
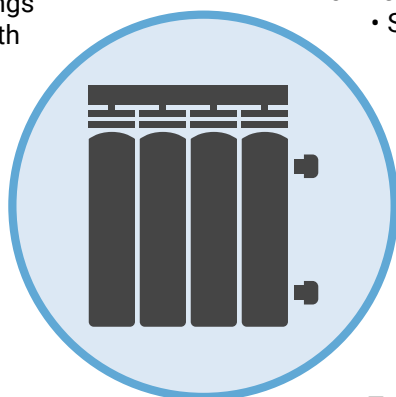
RSES local Chapters and Regional Association events offer exciting and valuable educational and networking opportunities. RSES also provides volunteer opportunities to serve the profession and the Association in many areas through its local Chapters or Regional Association.

5. Member-only Benefits and Services

- Special discounts on training and educational opportunities (print, digital and through the HVACR Learning Network).
- A subscription to *RSES Journal*, the HVACR industry's premiere technical trade magazine.
- Access to the entire contents of the Service Application Manual (SAM) online, plus free periodic SAM updates.
- North American Technician

Excellence (NATE) has recognized many RSES training courses and events. Technicians who successfully complete one or more of these instructor-led courses, or approved events, will receive credit toward renewing their NATE certification.

- RSES Technical Institute provides a comprehensive course of study designed to help members who desire to attain the highest levels of technical competency.
- Certificate Member (CM), Specialist Member (SM) and Certificate Member Specialist (CMS) are classifications of membership exclusive to RSES Members. This status signifies to customers, employers, and the entire HVACR industry your knowledge and commitment to excellence and improvement. Some restrictions apply for Student Members.
- RSES individual and corporate Members enjoy discounts on job-posting fees at the RSES Career Center. In addition, RSES Members have exclusive access to new job openings for seven days before the job is posted to the general public.
- Admittance to the Members-only section of the RSES website, allowing exclusive access to the *RSES Journal* archives section that contains features and technical articles in PDF format dating back to December 1995. Topics include tips on servicing, maintaining, and troubleshooting commercial and residential HVACR



equipment. This includes access to the MSAC Hotline and Troubleshooting Archives, two columns that are exclusive to *RSES Journal*. The MSAC (Manufacturers Service Advisory Council) comprises longtime industry experts who answer technical questions submitted by readers. Troubleshooting offers an HVACR technical problem each month and the final answer that eventually solved it.

- Chapter training programs based on training courses that are available at discounted prices to Members.
- Continuing education hours or units (CEHs/CEUs) for specific training programs.
- Networking opportunities through Chapter, state, and regional conferences.
- Use of the RSES logo on all correspondence and on Chapter websites.
- Various insurance programs are available to RSES Members through Selman & Company.
- Discounts on select services through affinity partnerships, including: AT&T; AVIS; Budget; UPS and UPS Member Freight; Office Depot; Lenovo; and more.

RSES School, Corporate and Contractor Members additionally receive the following benefits:

- Discounted advertising rates in *RSES Journal*.
- Ability to appoint proctors for RSES certification exams.
- Discounts for corporate exhibit booths at the RSES events.
- A listing/contact info in the Web-based Corporate Members Directory.
- The ability to use POs for training/testing materials and merchandise orders instead of requiring prepayment.

Types of RSES Memberships

Membership Classes

RSES is composed of five classes of membership:

- **Student**—Anyone enrolled in HVACR technology programs within regionally accredited vocational training institutions
- **Associate**—Anyone identified with, but not actively engaged in, the HVACR industry
- **Active**—Anyone actively engaged in the HVACR industry
- **Certificate**—Active members who have passed the Certificate Member exam
- **Specialist**—Members who have passed one or more of the Specialist exams, but not the Certificate Member exam.
- **Certificate Member Specialist**—Members who have passed both the Certificate Members exam and one or more of the Specialist exams.

Student Member = \$51.50: If you are a student currently enrolled in an accredited HVACR program and would like to join RSES you may qualify for RSES Student Membership. This membership provides students with an introduction to the Society while gaining the benefits of full membership. The only benefit that students must await is the ability to take the Certificate Member, Specialist Member or Certificate Member Specialist exam.

Students may retain Student Member classification for a period of four years, as long as they are actively enrolled in an accredited HVACR program. RSES require proof of enrollment in a program by submitting a copy of their class schedule, current school ID, or a letter from the instructor on school letterhead stating they are enrolled in the program. This should be submitted with the application.

All new students receive an RSES Technical Institute Student patch.

Individual Member = \$128/year: Keeping up with the latest advances in the HVACR industry can be a challenge, but becoming a member of RSES can provide the training and education to help you stay up to speed with the latest information, procedures and advances to help you achieve your career goals.

Considering the wealth of materials that RSES offers members to help in HVACR careers, it is no surprise that RSES's specialized HVACR training and education programs are the primary reason that individuals join RSES.

Lifetime Member = \$2,500: Individuals who understand the benefits of continuing education and professional development may choose to join RSES as a lifetime member. Lifetime members pay one lump sum fee and are extended full RSES membership privileges for the duration of their lives. Please note, existing members of RSES who wish to obtain Lifetime Membership must pay the full amount, this cannot be pro-rated based on number of years already paid.

Retired/Disabled/Veteran Member = \$46.50: To qualify for retired dues, an individual must be 60 years of age and have had continuous membership in RSES for 20 years or more. To qualify for disability dues, individuals need to include a copy of federal government documentation showing "approval for disability." To qualify for veteran membership, individuals should supply a copy of their military ID card. A reduced dues affidavit should also be included.

Manufacturer/Producer = See Chart: Product manufacturers and producers are welcome to join RSES at three different tier levels: small, medium or large, depending upon the number of employees. This membership would include a company that produces finished goods from raw materials by using various tools, equipment, and processes, and then sells the goods to consumers, wholesalers, distributors, retailers, or to other manufacturers for the production of more complex goods. This membership resides under the company's name rather than an individual's, but includes all of the same membership benefits an individual receives.

Manufacturer/Producer	Annual Dues	No. of Individuals with access to RSES Journal
• Small (fewer than 100 employees)	\$300	3
• Medium (101-500 employees)	\$500	5
• Large (more than 500 employees)	\$1,000	10

Manufacturer's Rep = \$150: This type of membership is for an independent business that fulfills the sales, marketing and customer service tasks for manufacturing companies.

Power Utility = \$250: RSES welcomes power utilities to join as Members and show their support of continuing education and certification. This membership also resides under the company's name rather than an individual's and would include any corporation, agency, authority or other legal entity instrumentality aligned with distribution facilities for delivery of electric, water or gas energy for use primarily by the public.

Wholesaler/Distributors = \$200: This type of membership category is for companies that work with retailers to match their needs through buying products in bulk at a discount or take a more proactive approach in educating resellers about new products and services. Similar to the other corporate memberships, this one is assigned under the company's name.

Industry Association = \$200: This membership is designed for industry trade associations that participates in public relations activities such as advertising, education, publishing, lobbying, and political donations, but its focus is collaboration between companies.

Contractor Corporate Member = See Chart: The Contractor Corporate Membership provides education, training and certification for businesses with multiple employees looking to obtain the value of membership. Contractor Corporate Members receive up to four free individual memberships (depending on size of company) or unlimited discounted individual memberships. Memberships are transferrable to new employees, as they belong to the company instead of the individual. Help advance your business with the power of continued employee training, certification, discounts on products/services and a variety of additional business support benefits. Corporate Members additionally receive a company link on the RSES website.

Contractor Corporate	Annual Dues	No. of Individuals with access to RSES Journal	No. of RSES memberships included	Additional discounted individual memberships
• Bronze (1–3 HVACR employees*)	\$350	1	1	\$110/Member
• Silver (4–10 HVACR employees*)	\$500	2	2	\$105/Member
• Gold (11–19 HVACR employees*)	\$750	3	3	\$100/Member
• Platinum (20+ HVACR employees*)	\$1,100	4	4	\$90/Member

* Includes service/installation technicians, first-line supervisors, estimators, schedulers, sheet metal specialists, etc.

School Corporate Member = See Chart: The School Corporate Member package receives access to education, training and certification that can assist in further developing and strengthening your school HVACR program. This membership includes one free instructor membership, the ability to assign a proctor and provide industry exams, reduced pricing on training and educational opportunities, a direct billing option, access to technical information and much more. Also students enrolled at the school received a discounted membership rate of \$40/year (normally \$51.50)

To begin your School Corporate Membership, you may sign your school up today by downloading this fillable PDF and emailing/faxing it to us. Any participating instructor will need to complete and return the appropriate membership form(s) and students of a School Corporate Member may join also join for \$40/year, regularly \$51.50/year.

School Corporate	Annual Dues	No. of Individuals with access to RSES Journal	No. of RSES memberships included	Additional discounted individual memberships
Annual School Assessment	\$250	1	1	\$115/Member
Student Member		1	1	\$40/Member

Note: In addition to benefits listed above, the Manufacturer/Producer, Power Utility, Wholesaler/Distributor, Manufacturer's Representative, Industry Association, Contractor and School Corporate Members are also listed in the service directory available on the website, which includes basic contact information, a company logo and a direct link to each Member's website.

Join RSES Today

The most immediate way to join RSES is through the RSES website. Come visit us at www.rses.org/ctrcorp.aspx. Once there, select the "Join Now" link under the type of Membership you would like, complete the enrollment form(s) and start enjoying membership benefits, including deep discounts on training and educational materials.

Additional forms are required for Contractor Corporate and School Corporate memberships. These are available in the corresponding Member type are of the site. If you need any help, contact RSES Headquarters:

RSES
PO Box 248
Arlington Heights, IL 60006-0248
Phone: 800-297-5660 or 847-297-6464
Fax: 847-297-5038
Email: membership@rses.org
Web site: www.rses.org



RSES Journal

RSES Journal, the official magazine of RSES, is the industry's leading source for technical information that HVACR contractors and service technicians can apply on the jobsite. In July 1933—just four months after RSES' incarnation in February—its first official publication, Refrigeration Service Engineer (RSE), came into being thanks to RSES founder Herbert Herkimer and J.F. Nickerson of Nickerson and Collins Co.

Nickerson and Collins Co. was eventually purchased by H.T. McDermott—one of the first Members to join RSES. In January 1957, RSE

appeared in mailboxes as *Refrigeration Service and Contracting* (RSC). After the death of McDermott in October 1965, RSC was purchased by the recently named President of Nickerson and Collins Co., Jack Robinson; who not only steered the publishing company into the up-in-coming technological age, but also oversaw RSC's publication for the next 20 years. In June 1985, Business News Publishing—now BNP Media—took over publishing the magazine.

RSES finally found its home inside the walls of RSES' Des Plaines, IL, International Headquarters in June 1995, when it was renamed *RSES Journal*.

RSES Journal Vision Statement: To continue as the industry's leading source for technical information that HVACR contractors and service technicians can apply on the jobsite.

RSES Journal Mission Statement: *RSES Journal's* mission is to provide authoritative, useful information to the RSES Member and the HVACR industry on the installation, maintenance, service and repair of HVACR equipment; new technology; new products; industry trends and issues; business management and customer service; and news about RSES Regional, State and Chapter activities. *RSES Journal* supports RSES' mission to provide world-class training and education for its Members and the HVACR industry.

On-the-job-quality Technical Content

RSES Journal readers are engaged in the full range of HVACR work, including heating, ventilation, air-conditioning and refrigeration; many are involved in more than one area, including: light commercial, residential and commercial/industrial. Nearly 40% of *RSES Journal* readers hold at least one or more type of HVACR industry certification—such as SM, CM, CMS, NATE, HVAC Excellence, etc.—demonstrating that readers are skilled in and knowledgeable about their trade.

The *RSES Journal* editorial staff works with longtime experts in RSES and the HVACR industry to produce comprehensive, authoritative technical articles covering the installation, servicing, maintenance, and troubleshooting of HVACR equipment and components, as well as new technologies.

RSES Journal works with the *RSES Journal* Technical Review Committee to ensure the quality and accuracy of all technical articles. The committee comprises HVACR industry experts whose experience represents decades of knowledge. They are an important reason why *RSES Journal* is the authority for HVACR technical information.



In addition to a regular selection of technical articles, *RSES Journal* offers an array of monthly columns, departments and special features, such as:

- **Leading Off:** This editorial-style department is the RSES President's tool to reach out to all of the RSES members. Whether related to the HVACR industry in general or specific RSES endeavors and accomplishments, this monthly read provides a behind-the-scenes perspective into the association.
- **Heating Up:** Editor-in-Chief ??? showcases a unique perspectives and insight on news and trends in the industry. Keep an eye peeled for an occasional guest viewpoint to accompany the editor's column.
- **In the Field:** Coverage of the important news and developments in the HVACR industry is presented in an easy-to-read format.
- **Calendar of Events:** Featured in the Industry News department, the calendar of events offers a comprehensive list of
- **Troubleshooting:** A detailed technical problem is presented monthly in this column, and readers are invited to submit their solutions. The reader who is first to submit and correctly solve the problem wins a prize, and all correct solutions are entered into a quarterly prize drawing.
- **Products:** This department presents readers with brief descriptions of the latest HVACR products and services available.
- **RSES News:** These two departments keep readers informed about new programs and news emanating from RSES Headquarters, Chapters, and regions.
- **Last Word:** This popular back-of-the-book department includes technical and safety tips for contractors, service technicians, and installers.

The *RSES Journal* website (www.rsesjournal.com) provides access to flipbook versions of the magazines archives starting in March 2017, which was when the first digital edition was launched. Feature articles, technical columns and various other departments are also available as individual PDFs available for Members to read and/or download in the Member section of the website.

RSES Website

In addition to access to Members-only benefits—including discounted products/services, *RSES Journal* subscription, access to hundreds of SAM Chapters and more—the RSES website (www.rses.org) hosts tools, forms and applications required for all levels of Local Chapter, Regional Association and International Society business.

Chapter Web Officers are able to gain access to their Chapter Member rosters in order to create eBlasts to announce upcoming educational/networking events, business meeting, elections and more using RSES's emailing portal. In addition, several tools are available to Chapter leaders including How-To Guides/Training Manuals, CEH Certificate templates, Officer Election report templates, RSES Bylaws, PowerPoint Templates, RSES Oath of Office, Presentation Scripts and more.

RSES Members receive access to My RSES Home Page. In addition to everything listed in the first paragraph, Members can access webinar archives from 2013 to current, current affinity partnership offers, messages from the RSES International President, access to tracked training history (if CEHs/CEUs are submitted to HQ), Chapter location map and contacts, a variety of application forms, Career Center access and more.

RSES is in the process of updating its website. More information will be announced as it becomes available

TRAINING/CERTIFICATION

RSES comprehensive training courses cover all aspects of the HVACR service industry, beginning with basic theory and extending to complex troubleshooting. Training courses can be conducted by local Chapters, corporate training facilities or through self-study. RSES training series include refrigeration and air conditioning, electricity, controls, heating, heat pump, the RSES Technical Institute Training Manuals. Whether the HVACR professional is looking for completion certificates, complete with CEHs/CEUs, or certification programs, RSES has it all.

After studying the courses, professionals should consider certification options available. When HVACR professionals invest in themselves through continuing education and certification, a higher standard of job performance becomes inevitable. Being certified signifies the HVACR professional has the technical skills and knowledge and has met the necessary requirements to install and service today's complex HVACR systems effectively. Whether it is an EPA Section 608, Hydrocarbon, A2L, R-410A or NATE certification, or RSES CM, SM or CMS status, certifications prove competency to employers and customers, while highlighting areas of expertise.

Many organizations, such as North American Technician Excellence (NATE), and state licensing bodies will accept RSES as a continuing education provider. The training courses that have been recognized and approved for continuing education hours toward renewing NATE certifications are listed on pg. 67.

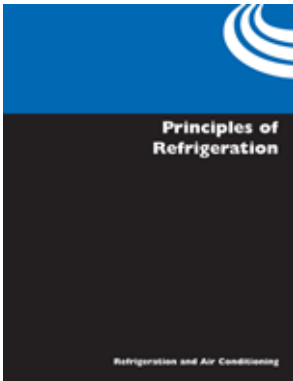
In addition, RSES has entered into an articulation agreement with The Pennsylvania State University affiliate, Pennsylvania College of Technology, based in Williamsport, PA, that provides college credit for students who have completed RSES training courses (see pg. 68). Under the agreement, Pennsylvania College of Technology will grant 51 credits for successful completion of specified RSES training courses toward a Bachelor of Science major in Heating, Ventilation & Air Conditioning Design Technology from its School of Construction & Design Technologies. For additional information, visit www.rses.org/training/collegedcreditforrsescourses.aspx.

Continuing Education Units (CEUs) are listed as a guideline to organizations interested in conducting classes in any of the listed courses. CEUs are issues only to those students who participate in instructor-led courses.

Refrigeration and Air Conditioning

Refrigeration and air conditioning (R/AC) continues to grow in importance in every segment of day-to-day living. RSES publishes a comprehensive series of manuals designed to teach individuals the fundamental concepts of refrigeration and air conditioning, while providing a thorough understanding of the more complex aspects of these systems—from component function to troubleshooting techniques and procedures.

Designed to provide the beginning student, as well as the practicing technician, with a comprehensive foundation of knowledge, these manuals start with an introduction to the basic theories and principles of refrigeration and air conditioning. They progress to examine major system components, gas laws, pressure/temperature relationships, tools of the trade, electricity for the service technician, an introduction to heat pumps, psychrometrics, heat transfer, air distribution and hydronics.



Principles of Refrigeration

32 CEHs, 3.2 CEUs

This manual introduces the fundamental concepts and theories of refrigeration and air conditioning. Basic physics, major component functions, gas laws, and pressure/temperature relationships are also introduced to assist in the understanding of the compression refrigeration cycle.

The instructor edition includes lesson objectives (available online to review), lesson review questions/answers as well as references to where the answers to each question may be found in the lesson. A final exam is available through RSES Headquarters, which will deliver a completion certificate upon passing for each student.

CONTENTS:

Lesson 1 Introduction to Refrigeration and Air Conditioning

Lesson 2 Basic Physics

Lesson 3 Major Component Functions

Lesson 4 Gas Laws (Part 1)

Lesson 5 Gas Laws (Part 2)

Lesson 6 Pressure/Temperature Relationship (Part 1)

Lesson 7 Pressure/Temperature Relationship (Part 2)

Lesson 8 The Compression Refrigeration Cycle (Part 1)

Lesson 9 The Compression Refrigeration Cycle (Part 2)

Lesson 10 The Compression Refrigeration Cycle (Part 3)

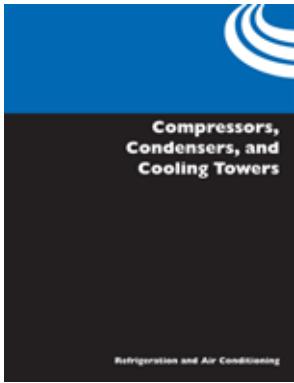
Lesson 11 Using Pressure and Enthalpy Diagrams (Part 1)

Lesson 12 Using Pressure and Enthalpy Diagrams (Part 2)

Lesson 13 Safe Practices and Public Relations

Lesson 14 Glossary of Terms

Item No.	Member Rate	Non-member Rate
720-901x Hard Copy ISBN: 978-1-61607-000-7	\$78	\$108
720-901e Digital Version ISBN: 978-1-61607-006-9	\$70	\$100
720-951x Instructor Edition Hard Copy ISBN: 978-1-61607-012-0	\$78	\$108
720-951e Instructor Edition Digital Version ISBN: 978-1-61607-018-2	\$70	\$100
720-901z Paper Exam	Call Headquarters for Rate	\$50
Online Exam	TBA	TBA



Compressors, Condensers, and Cooling Towers

36 CEHs, 3.6 CEUs

This manual provides comprehensive instruction on three major components of refrigeration and air conditioning systems: compressors, condensers and cooling towers. Gain knowledge of reciprocating, rotary, screw, centrifugal, and scroll compressors, as well as other classifications of compressors (open, semi-hermetic and hermetic). Air-cooled condensers, water-cooled condensers, evaporative condensers and cooling towers, and water treatment are also covered.

The instructor edition includes lesson objectives (available online to review), lesson review questions/answers as well as references to where the answers to each question may be found in the lesson. A final exam is available through RSES Headquarters, which will deliver a completion certificate upon passing for each student.

CONTENTS:

- Lesson 1 Compressors
- Lesson 2 Open-Type Compressors
- Lesson 3 Hermetic and Semi-Hermetic Compressors
- Lesson 4 Refrigeration System Accessories
- Lesson 5 Desiccants and Driers
- Lesson 6 Air-Cooled Condensers
- Lesson 7 Water-Cooled Condensers
- Lesson 8 Evaporative Condensers and Cooling Towers
- Lesson 9 Water Treatment (Part 1)
- Lesson 10 Water Treatment (Part 2)
- Lesson 11 Closed-Circuit Water Coolers
- Lesson 12 Air-Cooled Condensing Unit Room Requirements
- Lesson 13 Heat Transfer Coils
- Lesson 14 Multiple Rack Systems

Item No.	Member Rate	Non-member Rate
720-902x Hard Copy ISBN: 978-1-61607-001-4	\$78	\$108
720-902e Digital Version ISBN: 978-1-61607-007-6	\$70	\$100
720-952x Instructor Edition Hard Copy ISBN: 978-1-61607-013-7	\$78	\$108
720-952e Instructor Edition Digital Version ISBN: 978-1-61607-019-9	\$70	\$100
720-902z Paper Exam	Call Headquarters for Rate	\$50
Online Exam	TBA	TBA



Evaporators and System Components

38 CEHs, 3.8 CEUs

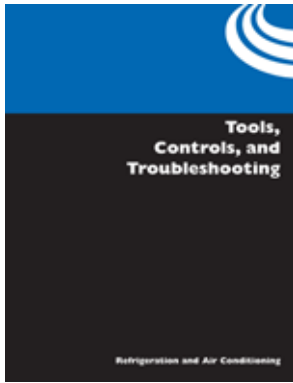
This manual provides instruction in the areas of refrigerant evaporators, metering devices, refrigeration system controls, refrigerant tables, refrigerant properties and characteristics, and refrigerant designations. Evaporator types include gravity coils, brine units, cold plate, shell-and-tube evaporators and blower evaporators. Refrigerant controls include pressure controls, temperature controls, differential controls, thermostat expansion valves, evaporator pressure regulators, suction pressure regulators, solenoid valves, and reversing valves. This Unit also includes instruction on refrigeration system piping, refrigerant recovery, and recycling and reclamation procedures.

The instructor edition includes lesson objectives (available online to review), lesson review questions/answers as well as references to where the answers to each question may be found in the lesson. A final exam is available through RSES Headquarters, which will deliver a completion certificate upon passing for each student.

CONTENTS:

- Lesson 1 Refrigeration Evaporators
- Lesson 2 Defrosting Methods
- Lesson 3 Capillary Tubes
- Lesson 4 Thermostatic Expansion Valves (Part 1)
- Lesson 5 Thermostatic Expansion Valves (Part 2)
- Lesson 6 Refrigeration System Controls
- Lesson 7 Refrigerant Tables
- Lesson 8 Refrigerant Properties and Characteristics
- Lesson 9 Refrigerant Designations
- Lesson 10 Oil in Refrigeration Systems
- Lesson 11 Recover, Recycle, Reclaim
- Lesson 12 Safe Handling of Refrigerants and Cylinders
- Lesson 13 Refrigerant System Piping (Part 1)
- Lesson 14 Refrigerant System Piping (Part 2)
- Lesson 15 Retrofits and Disposal Requirements

Item No.	Member Rate	Non-member Rate
720-903x Hard Copy ISBN: 978-1-61607-002-1	\$78	\$108
720-903e Digital Version ISBN: 978-1-61607-008-3	\$70	\$100
720-953x Instructor Edition Hard Copy ISBN 978-1-61607-014-4	\$78	\$108
720-953e Instructor Edition Digital Version ISBN: 978-1-61607-020-5	\$70	\$100
720-903z Paper Exam	Call Headquarters for Rate	\$50
Online Exam	TBA	TBA



Tools, Controls & Troubleshooting

42 CEHs, 4.2 CEUs

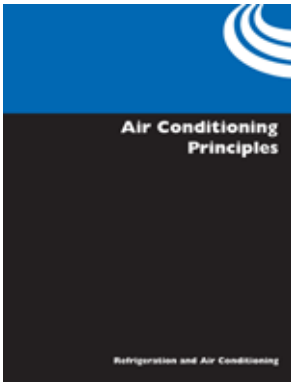
Instruction is provided on the proper use of trade tools associated with refrigeration and air conditioning, including tube benders and cutters, ratchet wrenches, flaring tools, pinch-off and swaging tools, voltage testers, vacuum pumps and vacuum gauges, and charging cylinders. This Unit also provides comprehensive instruction on servicing electric motors, capacitors, motor protectors, and direct digital controls (DDC). Troubleshooting is emphasized in this Unit, with five Lessons dedicated to this vital activity. Proper procedures for replacing compressors and evacuating systems are covered as well.

The instructor edition includes lesson objectives (available online to review), lesson review questions/answers as well as references to where the answers to each question may be found in the lesson. A final exam is available through RSES Headquarters, which will deliver a completion certificate upon passing for each student.

CONTENTS:

Lesson 1 Trade Tools
 Lesson 2 Electricity for the Service Technician (Part 1)
 Lesson 3 Electricity for the Service Technician (Part 2)
 Lesson 4 Electric Motors in Refrigeration Systems
 Lesson 5 Motor Capacitors
 Lesson 6 Motor Protectors
 Lesson 7 Low-Voltage Thermostats
 Lesson 8 Introduction to Pneumatic Controls (Part 1)
 Lesson 9 Introduction to Pneumatic Controls (Part 2)
 Lesson 10 Direct Digital Controls
 Lesson 11 Troubleshooting (Part 1)
 Lesson 12 Troubleshooting (Part 2)
 Lesson 13 Troubleshooting (Part 3)
 Lesson 14 Troubleshooting (Part 4)
 Lesson 15 Troubleshooting (Part 5)
 Lesson 16 Compressor Replacement and System Evacuation

Item No.	Member Rate	Non-member Rate
720-904x Hard Copy ISBN: 978-1-61607-003-8	\$78	\$108
720-904e Digital Version ISBN: 978-1-61607-009-0	\$70	\$100
720-954x Instructor Edition Hard Copy ISBN: 978-1-61607-015-1	\$78	\$108
720-954e Instructor Edition Digital Version ISBN: 978-1-61607-021-2	\$70	\$100
720-904z Paper Exam	Call Headquarters for Rate	\$50
Online Exam	TBA	TBA



Air Conditioning Principles

37 CEHs, 3.7 CEUs

This manual offers instruction on the basic principles of air conditioning. Residential air conditioning systems, basic heat pump theory, water-source heat pumps, computer room environmental control, and economizer systems are explored. Psychrometrics and the proper steps for calculating cooling loads for residential structures are also explained.

The instructor edition includes lesson objectives (available online to review), lesson review questions/answers as well as references to where the answers to each question may be found in the lesson. A final exam is available through RSES Headquarters, which will deliver a completion certificate upon passing for each student.

CONTENTS:

- Lesson 1 Moisture in Air
- Lesson 2 Calculating Cooling Loads
- Lesson 3 Room Air Conditioners
- Lesson 4 Types of Air Conditioning Systems
- Lesson 5 Residential Air Conditioning (Part 1)
- Lesson 6 Residential Air Conditioning (Part 2)
- Lesson 7 Residential Air Conditioning (Part 3)
- Lesson 8 Basic Heat Pump Theory (Part 1)
- Lesson 9 Basic Heat Pump Theory (Part 2)
- Lesson 10 Water-Source Heat Pumps
- Lesson 11 Psychrometrics
- Lesson 12 The Psychrometric Calculator
- Lesson 13 Computer Room Environmental Control
- Lesson 14 Economizer Systems (Part 1)
- Lesson 15 Economizer Systems (Part 2)

Item No.	Member Rate	Non-member Rate
720-905x Hard Copy ISBN: 978-1-61607-004-5	\$78	\$108
720-905e Digital Version ISBN: 978-1-61607-009-0	\$70	\$100
720-955x Instructor Edition Hard Copy ISBN: 978-1-61607-016-8	\$78	\$108
720-955e Instructor Edition Digital Version ISBN: 978-1-61607-022-9	\$70	\$100
720-905z Paper Exam	Call Headquarters for Rate	\$50
Online Exam	TBA	TBA



Heat Transfer and Distribution

32 CEHs, 3.2 CEUs

This manual introduces the basic principles of heat transfer. Radiation, conduction, and convection are explained in detail, along with estimating heat loads for residential structures and the principles of air distribution. Included are Lessons related to fans and blowers and instruction on fan laws, fan classifications, centrifugal fans, and fan efficiency.

The instructor edition includes lesson objectives (available online to review), lesson review questions/answers as well as references to where the answers to each question may be found in the lesson. A final exam is available through RSES Headquarters, which will deliver a completion certificate upon passing for each student.

CONTENTS:

Lesson 1 Heat Transfer (Part 1)
 Lesson 2 Heat Transfer (Part 2)
 Lesson 3 Estimating the Heat Load (Part 1)
 Lesson 4 Estimating the Heat Load (Part 2)
 Lesson 5 Fans and Blowers (Part 1)
 Lesson 6 Fans and Blowers (Part 2)
 Lesson 7 Air Filters and Electrostatic Cleaning
 Lesson 8 Air Distribution (Part 1)
 Lesson 9 Air Distribution (Part 2)
 Lesson 10 Air Distribution (Part 3)
 Lesson 11 Hydronics (Part 1)
 Lesson 12 Hydronics (Part 2)
 Lesson 13 Hydronics (Part 3)

Item No.	Member Rate	Non-member Rate
720-906x Hard Copy ISBN: 978-1-61607-005-2	\$78	\$108
720-906e Digital Version ISBN: 978-1-61607-005-2	\$70	\$100
720-956x Instructor Edition Hard Copy ISBN: 978-1-61607-017-5	\$78	\$108
720-956e Instructor Edition Digital Version ISBN: 978-1-61607-023-6	\$70	\$100
720-906z Paper Exam	Call Headquarters for Rate	\$50
Online Exam	TBA	TBA



R/AC Complete Series*

The Refrigeration and Air Conditioning Complete Series includes all six manuals: Principles of Refrigeration; Compressors, Condensers and Cooling Towers; Evaporators and System Components; Tools, Controls and Troubleshooting; Air Conditioning Principles; and Heat Transfer and Distribution.

The instructor edition includes lesson objectives (available online to review), lesson review questions/answers as well as references to where the answers to each question may be found in the lesson. A final exam is available through RSES Headquarters, which will deliver a completion certificate upon passing for each student.

Item No.	Member Rate	Non-member Rate
720-900x Hard Copy	\$364	\$526
720-950x Instructor Edition Hard Copy	\$364	\$526

*Pricing reflects a 10% discount.

Air Conditioning Fundamentals eLearning Course

20 CEHs, 2.0 CEUs



This eLearning course offers a thorough introduction to the concepts, laws and processes related to air conditioning systems. The modules that make up this course most directly resemble content within the first few Lessons of the R/AC Unit 1: Principles of Refrigeration manual as well as the, RSES Technical Institute Manual 1.

A final exam is provided after each module and a certificate of completion is automatically generated after successfully passing each one. The course may be purchased in its entirety or by individual

modules and is available for 365 days after purchases. The full course includes:

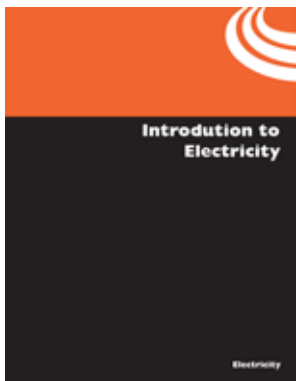
- Module 1 Introduction to Basic System Operation
- Module 2 Basic Structure of Matter
- Module 3 Heat Energy
- Module 4 Gas Laws 1
- Module 5 Gas Laws 2
- Module 6 Pressure-Temperature Relationship

Item No.	Member Rate	Non-member Rate
800-200e - Full Course	\$150	\$200
800-201e - Module 1	\$40	\$55
800-202e - Module 2	\$40	\$55
800-203e - Module 3	\$40	\$55
800-204e - Module 4	\$40	\$55
800-205e - Module 5	\$40	\$55
800-206e - Module 6	\$40	\$55
Group Rates Available	Call Headquarters for Rates	

Electricity

Workers in the HVACR industry make a living working with and around electricity during the installation, maintenance and repair of both high and low voltage systems. As such, RSES publishes a comprehensive series of manuals designed to teach individuals the fundamental concepts of electricity as they pertain to the HVACR industry as well as a thorough understanding of electrical components, electronics, and troubleshooting components.

Within the entire series, participants will study the major components of HVACR equipment with instruction related to basic electronics, troubleshooting components, reading schematics and troubleshooting residential equipment utilizing basic procedures commonly used in servicing the electrical systems of residential and light commercial HVACR equipment.



Introduction to Electricity

25 CEHs, 2.5 CEUs

This manual explores the fundamental concepts of electricity and magnetism. Voltage, direct and alternating current, series and parallel circuits, electrical symbols and schematic diagrams, and electrical safety are also covered.

The instructor edition includes lesson objectives (available online to review), lesson review questions/answers as well as references to where the answers to each question may be found in the lesson. A final exam is available through RSES Headquarters, which will deliver a completion certificate upon passing for each student.

CONTENTS:

- Lesson 1 Fundamental Concepts of Electricity
- Lesson 2 Fundamental Concepts of Magnetism
- Lesson 3 Voltage = EMF = Potential Difference
- Lesson 4 Fundamental Concepts of Direct Current
- Lesson 5 Fundamental Concepts of Alternating Current
- Lesson 6 Series and Parallel Circuits
- Lesson 7 Electrical Symbols and Schematic Diagrams
- Lesson 8 Electrical Safety

Item No.	Member Rate	Non-member Rate
730-901x Hard Copy ISBN: 978-1-61607-024-3	\$78	\$108
730-901e Digital Version ISBN: 978-1-61607-029-8	\$70	\$100
730-951x Instructor Edition Hard Copy ISBN: 978-1-61607-034-2	\$78	\$108
730-951e Instructor Edition Digital Version ISBN: 978-1-61607-039-7	\$70	\$100
730-901z Paper Exam	Call Headquarters for Rate	\$50
Online Exam	TBA	TBA



Electrical Components

32 CEHs, 3.2 CEUs

This manual concentrates on the electrical components of HVACR equipment. Resistors, capacitors, inductors, transformers, relays and contactors, motors, circuit protection devices, conductors, power supplies, basic controls, and other miscellaneous components are included.

The instructor edition includes lesson objectives (available online to review), lesson review questions/answers as well as references to where the answers to each question may be found in the lesson. A final exam is available through RSES Headquarters, which will deliver a completion certificate upon passing for each student.

CONTENTS:

Lesson 1 Resistors and Resistance
 Lesson 2 Capacitors and Capacitance
 Lesson 3 Inductors and Inductance
 Lesson 4 Transformers
 Lesson 5 Relays and Contactors
 Lesson 6 Motors
 Lesson 7 Circuit Protection Devices
 Lesson 8 Conductors
 Lesson 9 Power Supplies
 Lesson 10 Basic Controls
 Lesson 11 Miscellaneous Components

Item No.	Member Rate	Non-member Rate
730-902x Hard Copy ISBN: 978-1-61607-025-0	\$78	\$108
730-902e Digital Version ISBN: 978-1-61607-030-4	\$70	\$100
730-952x Instructor Edition Hard Copy ISBN: 978-1-61607-035-9	\$78	\$108
730-952e Instructor Edition Digital Version ISBN: 978-1-61607-040-3	\$70	\$100
730-902z Paper Exam	Call Headquarters for Rate	\$50
Online Exam	TBA	TBA



Basic Electronics

40 CEHs, 4.0 CEUs

Beginning with a review of the basics, this manual offers instruction in solid-state fundamentals, diodes and power supplies, power supply regulation and filtration, transistors, silicon-controlled rectifiers, triacs, diacs, solid-state relays, Peltier diodes, basic binary math, analog and digital integrated circuits, and microprocessors and computers.

The instructor edition includes lesson objectives (available online to review), lesson review questions/answers as well as references to where the answers to each question may be found in the lesson. A final exam is available through RSES Headquarters, which will deliver a completion certificate upon passing for each student.

CONTENTS:

Lesson 1 Back to Basics
 Lesson 2 Solid-State Fundamentals
 Lesson 3 Diodes and Power Supplies
 Lesson 4 Power Supply Regulation and Filtration
 Lesson 5 Transistors
 Lesson 6 Silicon-Controlled Rectifiers
 Lesson 7 Triacs, Diacs, and Solid-State Relays
 Lesson 8 Peltier Diodes
 Lesson 9 Protective Devices
 Lesson 10 Number Systems
 Lesson 11 Logic Circuits
 Lesson 12 Digital Integrated Circuits
 Lesson 13 Analog Integrated Circuits
 Lesson 14 Microprocessors and Computers

Item No.	Member Rate	Non-member Rate
730-903x Hard Copy ISBN: 978-1-61607-026-7	\$78	\$108
730-903e Digital Version ISBN: 978-1-61607-031-1	\$70	\$100
730-953x Instructor Edition Hard Copy ISBN: 978-1-61607-036-6	\$78	\$108
730-953e Instructor Edition Digital Version ISBN: 978-1-61607-041-0	\$70	\$100
730-903z Paper Exam	Call Headquarters for Rate	\$50
Online Exam	TBA	TBA



Troubleshooting Components

44 CEHs, 4.4 CEUs

Learn the proper procedures for troubleshooting such major system components as resistors, capacitors, relays, contactors and starters, transformers, thermostats, motors, hermetic and semi-hermetic compressors, electronic components, and wiring systems in this manual.

The instructor edition includes lesson objectives (available online to review), lesson review questions/answers as well as references to where the answers to each question may be found in the lesson. A final exam is available through RSES Headquarters, which will deliver a completion certificate upon passing for each student.

CONTENTS:

Lesson 1 Test Equipment (Part 1)
 Lesson 2 Test Equipment (Part 2)
 Lesson 3 Resistors
 Lesson 4 Capacitors
 Lesson 5 Relays, Contactors, and Starters
 Lesson 6 Transformers
 Lesson 7 Thermostats
 Lesson 8 Motors
 Lesson 9 Hermetic Compressors
 Lesson 10 Semi-Hermetic Compressors
 Lesson 11 Electronic Components
 Lesson 12 Wiring Systems
 Lesson 13 Glossary of Terms

Item No.	Member Rate	Non-member Rate
730-904x Hard Copy ISBN: 978-1-61607-027-4	\$78	\$108
730-904e Digital Version ISBN: 978-1-61607-032-8	\$70	\$100
730-954x Instructor Edition Hard Copy ISBN: 978-1-61607-037-3	\$78	\$108
730-954e Instructor Edition Digital Version ISBN: 978-1-61607-037-3	\$70	\$100
730-904z Paper Exam	Call Headquarters for Rate	\$50
Online Exam	TBA	TBA



Troubleshooting Residential Equipment

48 CEHs, 4.8 CEUs

This manual is devoted solely to the subject of electrical troubleshooting. It covers basic procedures commonly used in servicing the electrical systems of residential and light commercial HVACR equipment. This Unit provides the entry-level service technician with a valuable set of recommended field-proven methods for performing the most frequently needed troubleshooting tasks. The experienced technician also will find the information useful as a ready source of reference, especially when considering alternative service procedures.

CONTENTS:

Lesson 1 Getting Started
 Lesson 2 Reading Schematics
 Lesson 3 Split Systems (Part 1)
 Lesson 4 Split Systems (Part 2)
 Lesson 5 Gas Furnaces (Part 1)
 Lesson 6 Gas Furnaces (Part 2)
 Lesson 7 Oil Furnaces
 Lesson 8 Electric Furnaces
 Lesson 9 Air-to-Air Heat Pumps
 Lesson 10 Water-Source Heat Pumps
 Lesson 11 Electronic Air Cleaners
 Lesson 12 Humidifiers
 Lesson 13 Electrical Troubleshooting Reference Guide

Item No.	Member Rate	Non-member Rate
730-905x Hard Copy ISBN: 978-1-61607-028-1	\$78	\$108
730-905e Digital Version ISBN: 978-1-61607-033-5	\$70	\$100
730-955x Instructor Edition Hard Copy ISBN: 978-1-61607-038-0	\$78	\$108
730-955e Instructor Edition Digital Version ISBN: 978-1-61607-043-4	\$70	\$100
730-905z Paper Exam	Call Headquarters for Rate	\$50
Online Exam	TBA	TBA



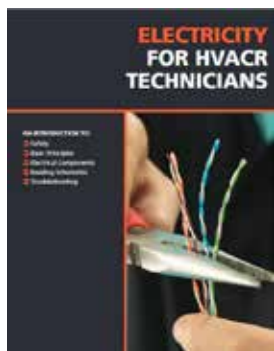
Electricity Complete Series*

The Electricity Complete Series includes all five manuals: Introduction to Electricity; Electrical Components; Basic Electronics; Troubleshooting Components; and Troubleshooting Residential Equipment.

The instructor editions include lesson objectives (available online to review), lesson review questions/answers as well as references to where the answers to each question may be found in the lesson. A final exam for each manual is available through RSES Headquarters, which will deliver a completion certificate upon passing for each student.

Item No.	Member Rate	Non-member Rate
730-900x Hard Copy	\$305	\$440
730-950x Instructor Edition Hard Copy	\$305	\$440

*Pricing reflects a 10% discount.



Electricity for HVACR Technicians

Electricity for HVACR Technicians combines the most popular Lessons from the Electrical Training Course into one publication. This two-color manual contains nearly 400 pages of in-depth electrical training specific to HVACR technicians, from the fundamentals of electricity and safety to troubleshooting and reading and understanding schematics. Additionally, this manual features a number of 11 x 17 foldout schematic and troubleshooting diagrams as well a glossary of terms.

CONTENTS:

Chapter 1 Electrical Safety
Chapter 2 Fundamentals of Electricity
Chapter 3 Understanding Electrical Schematics
Chapter 4 Magnetism and Transformers
Chapter 5 Relays, Contactors, and Starters
Chapter 6 Fundamentals of Alternating Current

Chapter 7 Series and Parallel Circuits
Chapter 8 Thermostats
Chapter 9 Motors and Capacitors
Chapter 10 Circuit Protection Devices
Chapter 11 Compressors
Chapter 12 Troubleshooting Gas Furnaces
Chapter 13 Troubleshooting Split Systems
Chapter 14 Reading Schematics
Appendix Glossary of Terms

Item No.	Member Rate	Non-member Rate
370-900x Hard Copy ISBN: 978-1-61607-044-1	\$98	\$128
730-905e Digital Version ISBN: 978-1-61607-044-1	\$90	\$120



Electricity for HVACR Technicians eLearning Course

36 CEHs, 3.6 CEUs

This eLearning course provides a thorough introduction to the concepts of electricity and magnetism, description of basic electrical devices that use these concepts, the concepts of alternating current and related devices, and the basic explanation of electrical schematics.

The modules that make up this course most directly resemble content within Electricity for HVACR Technicians manual as well as various lessons covered throughout each of the Electricity Training Manuals.

A final exam is provided after each module and a certificate of completion is automatically generated after successfully passing each one. The course may be purchased in its entirety or by individual modules and is available for 365 days after purchases. The full course includes:

Module 1 Terminology and Units of Measure

Module 2 Electronics—History and Concepts

Module 3 Series Circuits, Parallel Circuits and Power

Module 4 Magnetism and Transformers

Module 5 Magnetic Attraction, Repulsion and Shielding

Module 6 Transformers

Module 7 Relays, Contactors and Starters

Module 8 Fundamentals of Alternating Current

Module 9 Alternating Current: Reactance, Impedance & Power Factor

Module 10 Circuit Protection Devices: Fuses

Module 11 Circuit Breakers & Overload Protection

Module 12 Understanding Electrical Schematics

Item No.	Member Rate	Non-member Rate
800-013e - Full Course	\$150	\$200
800-001e - Module 1	\$40	\$55
800-002e - Module 2	\$40	\$55
800-003e - Module 3	\$40	\$55
800-004e - Module 4	\$40	\$55
800-005e - Module 5	\$40	\$55
800-006e - Module 6	\$40	\$55
800-007e - Module 7	\$40	\$55
800-008e - Module 8	\$40	\$55
800-009e - Module 9	\$40	\$55
800-010e - Module 10	\$40	\$55
800-011e - Module 11	\$40	\$55
800-012e - Module 12	\$40	\$55
Group Rates Available	Call Headquarters for Rates	

Controls

Controls can encapsulate sensors, relays, contactors, transformers, capacitors, valves, switches, relays, thermostats, among others, in an HVACR system. Any component within a system that works to manage refrigerant, airflow, humidity, temperature and pressure would fall within the category of controls. There are as many different types of controls as there are systems in the industry and knowing and understanding the basics of how they function is key in troubleshooting, installing and replacing them.

This comprehensive controls series offers participants the opportunity to learn and understand control fundamentals, pneumatic controls, electromechanical controls, basic electronics and electronic proportional controls.



Fundamentals of Controls

30 CEHs, 3.0 CEUs

This manual introduces the various types of controls found in HVACR equipment. Beginning with the types of mechanical equipment, the book progresses to control components and variables, control terminology, types of control systems, sequences of operation, control specifications, electrical safety, sensors, valves and dampers, and a glossary of terms.

The instructor editions include lesson objectives (available online to review), lesson review questions/answers as well as references to where the answers to each question may be found in the lesson. A final exam for each manual is available through RSES Headquarters, which will deliver a completion certificate upon passing for each student.

CONTENTS:

Lesson 1 Types of Mechanical Equipment
 Lesson 2 Controls Components and Variables
 Lesson 3 Control Terminology
 Lesson 4 Types of Control Systems
 Lesson 5 Sequences of Operation
 Lesson 6 Specifications
 Lesson 7 Electrical Safety
 Lesson 8 Sensors
 Lesson 9 Valves and Dampers
 Lesson 10 Glossary of Terms

Item No.	Member Rate	Non-member Rate
770-901x Hard Copy ISBN: 978-1-61607-070-0	\$78	\$108
770-951x Instructor Edition Hard Copy ISBN: 978-1-61607-080-9	\$78	\$108
770-901z Paper Exam	Call Headquarters for Rate	\$50
Online Exam	TBA	TBA



Pneumatic Controls

40 CEHs, 4.0 CEUs

This manual is dedicated to pneumatic controls. Material focuses on basic control theory, air supply equipment, thermostats and controllers, transmitter-receiver controller equipment, typical component applications, typical control applications, system applications, and control system maintenance.

The instructor editions include lesson objectives (available online to review), lesson review questions/answers as well as references to where the answers to each question may be found in the lesson. A final exam for each manual is available through RSES Headquarters, which will deliver a completion certificate upon passing for each student.

CONTENTS:

Lesson 1 Basic Control Theory
 Lesson 2 Air Supply Equipment (Part 1)
 Lesson 3 Air Supply Equipment (Part 2)
 Lesson 4 Thermostats and Controllers (Part 1)
 Lesson 5 Thermostats and Controllers (Part 2)
 Lesson 6 Transmitter-Receiver Controller Equipment
 Lesson 7 Pneumatic Relays
 Lesson 8 Valve and Damper Actuators
 Lesson 9 Typical Component Applications
 Lesson 10 Typical Control Applications
 Lesson 11 System Applications (Part 1)
 Lesson 12 System Applications (Part 2)
 Lesson 13 System Applications (Part 3)
 Lesson 14 Control System Maintenance
 Lesson 15 Glossary of Terms
 Lesson 16 Appendix

Item No.	Member Rate	Non-member Rate
770-902x Hard Copy ISBN: 978-1-61607-071-7	\$78	\$108
770-952x Instructor Edition Hard Copy ISBN: 978-1-61607-081-6	\$78	\$108
770-902z Paper Exam	Call Headquarters for Rate	\$50
Online Exam	TBA	TBA



Electromechanical Controls

40 CEHs, 4.0 CEUs

Beginning with electrical safety, this manual covers Ohm's Law, relays and contactors, transformers, capacitors, test instruments, electrical symbols and schematic diagrams, circuit protection devices, power supplies, electrical troubleshooting, control basics, modulating controls, and control applications.

The instructor editions include lesson objectives (available online to review), lesson review questions/answers as well as references to where the answers to each question may be found in the lesson. A final exam for each manual is available through RSES Headquarters, which will deliver a completion certificate upon passing for each student.

CONTENTS:

Lesson 1 Electrical Safety
 Lesson 2 Ohm's Law
 Lesson 3 Relays and Contactors
 Lesson 4 Transformers
 Lesson 5 Capacitors
 Lesson 6 Test Instruments
 Lesson 7 Electrical Symbols and Schematic Diagrams
 Lesson 8 Circuit Protection Devices
 Lesson 9 Power Supplies
 Lesson 10 Electrical Troubleshooting
 Lesson 11 Control Basics
 Lesson 12 Modulating Controls (Part 1)
 Lesson 13 Modulating Controls (Part 2)
 Lesson 14 Applications (Part 1)
 Lesson 15 Applications (Part 2)
 Lesson 16 Appendix

Item No.	Member Rate	Non-member Rate
770-903x Hard Copy ISBN: 978-1-61607-072-4	\$78	\$108
770-953x Instructor Edition Hard Copy ISBN: 978-1-61607-082-3	\$78	\$108
770-903z Paper Exam	Call Headquarters for Rate	\$50
Online Exam	TBA	TBA



Electronic Proportional Controls

40 CEHs, 4.0 CEUs

This manual begins with a review of the basics of electronic controls and progresses to measuring circuits, installation and wiring techniques, ac power and grounding practices, basic electronic troubleshooting, electronic controllers, adapters, and indicators, and final control devices.

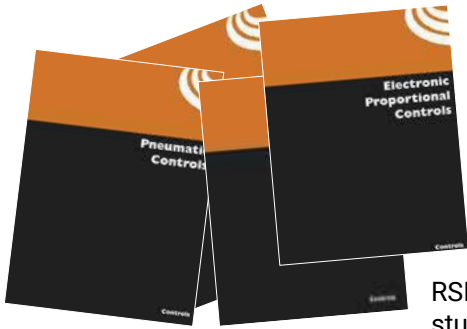
The instructor editions include lesson objectives (available online to review), lesson review questions/answers as well as references to where the answers to each question may be found in the lesson. A final exam for each manual is available through RSES Headquarters, which will deliver a completion certificate upon passing for each student.

CONTENTS:

Lesson 1 Introduction to Electronic Controls
Lesson 2 Solid-State Fundamentals
Lesson 3 Diodes and Power Supplies
Lesson 4 Power Supply Regulation and Filtration
Lesson 5 Silicon-Controlled Rectifiers
Lesson 6 Triacs, Diacs, and Solid-State Relays
Lesson 7 Protective Devices
Lesson 8 Measuring Circuits

Lesson 9 Installation and Wiring Techniques
Lesson 10 AC Power and Grounding Practices
Lesson 11 Basic Electronic Troubleshooting
Lesson 12 Electronic Controllers
Lesson 13 Electronic Adapters and Indicators
Lesson 14 Final Control Devices
Lesson 15 Applications (Part 1)
Lesson 16 Applications (Part 2)

Item No.	Member Rate	Non-member Rate
770-905x Hard Copy ISBN: 978-1-61607-074-8	\$78	\$108
770-955x Instructor Edition Hard Copy ISBN: 978-1-61607-084-7	\$78	\$108
770-905z Paper Exam	Call Headquarters for Rate	\$50
Online Exam	TBA	TBA



Controls Complete Series*

The Controls Complete Series includes all four manuals: Fundamentals of Controls; Pneumatic Controls; Electromechanical Controls; and Electronic Proportional Controls.

The instructor editions include lesson objectives (available online to review), lesson review questions/answers as well as references to where the answers to each question may be found in the lesson. A final exam for each manual is available through RSES Headquarters, which will deliver a completion certificate upon passing for each student.

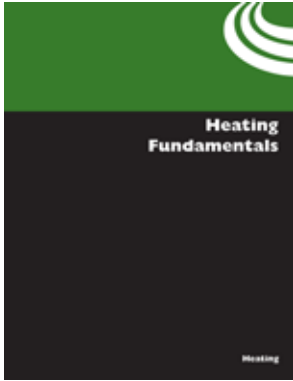
Item No.	Member Rate	Non-member Rate
730-900x Hard Copy	\$246	\$355
730-950x Instructor Edition Hard Copy	\$246	\$355

*Pricing reflects a 10% discount.

Heating

Heating comes in many forms in the industry and professionals will likely encounter every type of heating equipment in the field. Whether it is electric, gas, oil, hot water or steam heating systems, students, technicians, contractors and facility managers need to know the fundamentals first in order to specifying, install, troubleshoot and service all of them.

The Heating training series provides participants with instruction in various types of heating systems that are commonly used today. Beginning with heating fundamentals students will be introduced to the concepts of heat, heating principles, heat flow and air distribution, and heat load calculations. Independent manuals of study provide detailed instruction of electric heating, gas heating, oil heating, hot-water heating, and steam heating systems.



Heating Fundamentals

36 CEHs, 3.6 CEUs

This manual introduces the concepts of heat and the principles of heat flow. Lessons include heat loss from structures, a review of the fundamentals of heat load calculations, ducted warm air systems, duct sizing and layout, air filtration, humidification, a fundamental approach to control systems, customer relations, and a review of safety and codes.

The instructor edition includes lesson objectives (available online to review), lesson review questions/answers as well as references to where the answers to each question may be found in the lesson. A final exam for each manual is available through RSES Headquarters, which will deliver a completion certificate upon passing for each student.

CONTENTS:

- Lesson 1 Introduction to the Concept of Heat
- Lesson 2 Principles of Heating
- Lesson 3 Principles of Heat Flow
- Lesson 4 Heat Loss from Structures
- Lesson 5 Review of Fundamentals of Heat Load Calculation
- Lesson 6 Ducted Warm Air Systems/Room Air Distribution
- Lesson 7 Duct Sizing and Layout
- Lesson 8 Air Filtration
- Lesson 9 Humidification (Part 1)
- Lesson 10 Humidification (Part 2)
- Lesson 11 Control Systems: A Functional Approach
- Lesson 12 Review of Safety and Codes
- Lesson 13 Customer Relations
- Lesson 14 Glossary of Terms

Item No.	Member Rate	Non-member Rate
750-901x Hard Copy ISBN: 978-1-61607-046-5	\$78	\$108
750-901e Digital Version ISBN: 978-1-61607-052-6	\$70	\$100
750-951x Instructor Edition Hard Copy ISBN: 978-1-61607-058-8	\$78	\$108
750-951e Instructor Edition Digital Version ISBN: 978-1-61607-064-9	\$70	\$100
750-901z Paper Exam	Call Headquarters for Rate	\$50
Online Exam	TBA	TBA



Electric Heating

36 CEHs, 3.6 CEUs

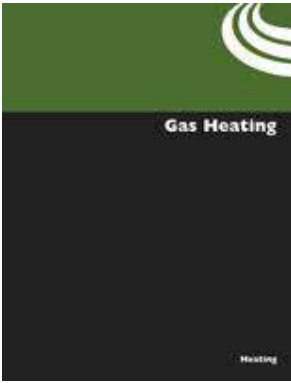
This manual focuses on heating with electricity. Material includes the principles of resistance heating, heat pumps, radiant heating systems, electric duct heaters and furnaces, baseboard and unit heaters, radiant heat installation, electric heating control devices, electric furnaces, multistep controllers, electronic sequencing controls, decentralized electric heating systems, and electric boilers.

The instructor edition includes lesson objectives (available online to review), lesson review questions/answers as well as references to where the answers to each question may be found in the lesson. A final exam for each manual is available through RSES Headquarters, which will deliver a completion certificate upon passing for each student.

CONTENTS:

Lesson 1 Heating with Electricity
 Lesson 2 Resistance Heating
 Lesson 3 Heat Pumps
 Lesson 4 Radiant Heating Systems
 Lesson 5 Duct Heaters and Furnaces
 Lesson 6 Baseboard and Unit Heaters
 Lesson 7 Radiant Heat Installation
 Lesson 8 System Control Devices
 Lesson 9 Electric Furnaces
 Lesson 10 Duct Heaters
 Lesson 11 Multi-Step Controllers (Part 1)
 Lesson 12 Multi-Step Controllers (Part 2)
 Lesson 13 Electronic Sequencing Control
 Lesson 14 Decentralized Electric Heating Systems
 Lesson 15 Electric Boilers

Item No.	Member Rate	Non-member Rate
750-902x Hard Copy ISBN: 978-1-61607-047-2	\$78	\$108
750-902e Digital Version ISBN: 978-1-61607-053-3	\$70	\$100
750-952x Instructor Edition Hard Copy ISBN: 978-1-61607-059-5	\$78	\$108
750-952e Instructor Edition Digital Version ISBN: 978-1-61607-065-6	\$70	\$100
750-902z Paper Exam	Call Headquarters for Rate	\$50
Online Exam	TBA	TBA



Gas Heating

32 CEHs, 3.2 CEUs

This manual explores the concepts of heating with gas. Lessons relate to combustion chemistry, heating fuels, burners and accessories, burner types and components (including natural gas-burning and LP gas-burning equipment), start-up and combustion efficiency testing, gas burner controls, ignition systems for infrared heaters, gas heating equipment maintenance, troubleshooting, and condensing furnaces.

The instructor edition includes lesson objectives (available online to review), lesson review questions/answers as well as references to where the answers to each question may be found in the lesson. A final exam for each manual is available through RSES

Headquarters, which will deliver a completion certificate upon passing for each student.

CONTENTS:

Lesson 1 Combustion Chemistry
 Lesson 2 Heating Fuels: Gas
 Lesson 3 Burners and Accessories
 Lesson 4 Burner Types and Components
 Lesson 5 Gas Burners: Equipment Location and Piping for Natural and Manufactured Gas
 Lesson 6 Gas Burners: LP Gas Installation Procedures
 Lesson 7 Start-Up and Combustion Efficiency Testing
 Lesson 8 Gas Burner Controls: Type, Purpose, and Function
 Lesson 9 Combination Gas Controls
 Lesson 10 Ignition Systems for Infrared Heaters
 Lesson 11 Gas Heating Equipment Maintenance
 Lesson 12 Troubleshooting
 Lesson 13 Condensing Furnaces
 Lesson 14 Appendix

Item No.	Member Rate	Non-member Rate
750-903x Hard Copy ISBN: 978-1-61607-048-9	\$78	\$108
750-953x Instructor Edition Hard Copy ISBN: 978-1-61607-060-1	\$78	\$108
750-903z Paper Exam	Call Headquarters for Rate	\$50
Online Exam	TBA	TBA



Oil Heating

36 CEHs, 3.6 CEUs

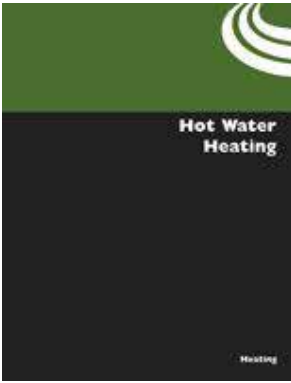
This comprehensive manual on oil heating includes the origin, refining process, and burning characteristics of fuel oil. In addition, equipment application parameters, burner and accessories, fuel characteristics, oil burners, tanks and piping ignition systems, oil burner controls, troubleshooting and industrial flame safeguard controls are discussed in detail.

The instructor edition includes lesson objectives (available online to review), lesson review questions/answers as well as references to where the answers to each question may be found in the lesson. A final exam for each manual is available through RSES Headquarters, which will deliver a completion certificate upon passing for each student.

CONTENTS:

Lesson 1 Fuel Oils: Origin, Refining Process, and Burning Characteristics
 Lesson 2 Equipment Application Parameters
 Lesson 3 Burners and Accessories
 Lesson 4 Fuel Characteristics, Fuel/Burner Relationship, and Burners
 Lesson 5 Burners: Capacity Selection and Combustion Chamber Installation
 Lesson 6 Tanks and Piping: Fuel Units and Ignition Systems
 Lesson 7 Oil Burners: Controls, Start-Up, and Combustion Efficiency
 Lesson 8 Understanding Oil Burner Controls (Part 1)
 Lesson 9 Understanding Oil Burner Controls (Part 2)
 Lesson 10 Troubleshooting Primary Controls
 Lesson 11 Troubleshooting Components (Part 1)
 Lesson 12 Troubleshooting Components (Part 2)
 Lesson 13 Troubleshooting Controlled Components
 Lesson 14 Industrial Flame Safeguard Controls
 Lesson 15 Troubleshooting Systems

Item No.	Member Rate	Non-member Rate
750-904x Hard Copy ISBN: 978-1-61607-049-6	\$78	\$108
750-954x Instructor Edition Hard Copy ISBN: 978-1-61607-061-8	\$78	\$108
750-904z Paper Exam	Call Headquarters for Rate	\$50
Online Exam	TBA	TBA



Hot Water Heating

38 CEHs, 3.8 CEUs

Beginning with an introduction to hot water heating, this Unit offers instruction in the principles and theories of hot water heating. Learn about hot water boilers and controls, heat transfer units, centrifugal pumps, air controls, hot water specialties, piping methods, pressure drop calculations, zoning, primary/secondary pumping, radiant heating systems, temperature controls, troubleshooting system components, and analysis of system problems.

The instructor edition includes lesson objectives (available online to review), lesson review questions/answers as well as references to where the answers to each question may be found in the lesson. A final exam for each manual is available through RSES Headquarters, which will deliver a completion certificate upon passing for each student.

CONTENTS:

Lesson 1 Introduction to Hot Water Heating
 Lesson 2 Hot Water Boilers and Controls
 Lesson 3 Heat Transfer Units
 Lesson 4 Centrifugal Pumps
 Lesson 5 Air Control
 Lesson 6 Hot Water Specialties
 Lesson 7 Piping Methods
 Lesson 8 Zoning
 Lesson 9 Primary/Secondary Pumping
 Lesson 10 Hydronic Radiant Heating Systems
 Lesson 11 Temperature Controls
 Lesson 12 Troubleshooting Components (Part 1)
 Lesson 13 Troubleshooting Components (Part 2)
 Lesson 14 Troubleshooting Components (Part 3)
 Lesson 15 Troubleshooting Hydronic Systems

Item No.	Member Rate	Non-member Rate
750-905x Hard Copy ISBN: 978-1-61607-050-2	\$78	\$108
750-955x Instructor Edition Hard Copy ISBN: 978-1-61607-062-5	\$78	\$108
750-905z Paper Exam	Call Headquarters for Rate	\$50
Online Exam	TBA	TBA



Steam Heating

38 CEHs, 3.8 CEUs

This manual begins with basic steam and one-pipe heating systems. This book includes lessons that teach two-pipe heating systems, steam traps, steam specialties, steam piping practices, converters and instantaneous heaters, steam heat system controls, unit heaters and convectors, boilers, boiler start-up and operation, boiler installation, troubleshooting, and troubleshooting temperature and pressure regulators.

The instructor edition includes lesson objectives (available online to review), lesson review questions/answers as well as references to where the answers to each question may be found in the lesson. A final exam for each manual is available through RSES

Headquarters, which will deliver a completion certificate upon passing for each student.

CONTENTS:

- Lesson 1 Basic Steam and One-Pipe Heating Systems
- Lesson 2 Two-Pipe Steam Heating Systems
- Lesson 3 Steam Traps
- Lesson 4 Steam Specialties
- Lesson 5 Steam Piping Practices
- Lesson 6 Converters and Instantaneous Heaters
- Lesson 7 Steam Heat System Controls
- Lesson 8 Unit Heaters and Convectors
- Lesson 9 Boilers
- Lesson 10 Boiler Start-Up and Operation
- Lesson 11 Boiler Installation
- Lesson 12 Troubleshooting Temperature and Pressure Regulators

Item No.	Member Rate	Non-member Rate
750-906x Hard Copy ISBN: 978-1-61607-051-9	\$78	\$108
750-956x Instructor Edition Hard Copy ISBN: 978-1-61607-063-2	\$78	\$108
750-906z Paper Exam	Call Headquarters for Rate	\$50
Online Exam	TBA	TBA



Heating Complete Series*

The Heating Complete Series includes all six manuals: Heating Fundamentals; Electric Heating; Gas Heating; Oil Heating; Hot Water Heating; and Steam Heating.

The instructor editions include lesson objectives (available online to review), lesson review questions/answers as well as references to where the answers to each question may be found in the lesson. A final exam for each manual is available through RSES Headquarters, which will deliver a completion certificate upon passing for each student.

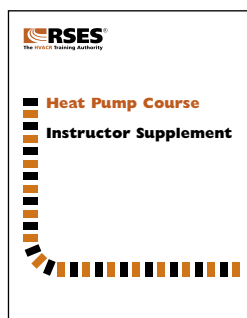
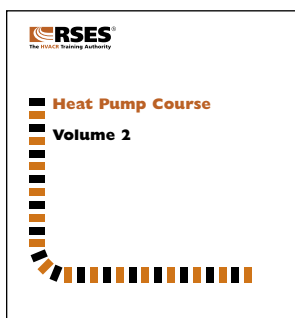
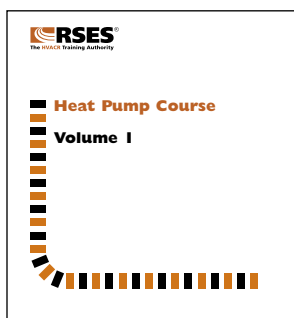
Item No.	Member Rate	Non-member Rate
750-900x Hard Copy	\$356	\$518
750-950x Instructor Edition Hard Copy	\$364	\$526

*Pricing reflects a 10% discount.

Heat Pumps

Rather than using fuel or electricity to generate heat from a furnace or heater, a heat pump lowers the temperature of a source by pulling heat from it, and raises the temperature at the destination by delivering heat to it using the thermodynamic properties of the intermediate fluid—refrigerant. Conventional heat pumps use the hot stream to increase temperatures at the delivery point and reject the cold to cool outside air. Likewise, conventional air-conditioners and refrigeration units use the cold stream to lower temperatures at the heat source and waste the hot to heat outside air.

The RSES Heat Pump course is written for those individuals who already have a basic background in refrigeration and air conditioning.



Heat Pump Training Course

128 CEHs, 12.8 CEUs

This two-volume manual covers heat pump fundamentals, components, applications, installation, and service. Heat gain and heat loss calculations based on ACCA's Manual J are included, as are troubleshooting guides for both the electrical and refrigeration systems. All types of

heat pump systems—both packaged systems and split systems—are studied, including air-to-air heat pumps, water-source heat pumps, and various kinds of special-purpose heat pumps, such as high-efficiency and multi-capacity units. The use of supplemental and auxiliary heat is discussed. The course also features a simplified performance guide/checklist for servicing heat pumps in both the heating and cooling cycles.

The instructor editions include lesson objectives (available online to review), lesson review questions/answers as well as references to where the answers to each question may be found in the lesson. A final exam for each manual is available through RSES Headquarters, which will deliver a completion certificate upon passing for each student.

Note: This course is sold only as a two-volume set. Volumes are not available individually.

VOLUME 1 CONTENTS:

Lesson 1 Heat Pump Fundamentals
 Lesson 2 Heat Pump Systems
 Lesson 3 Heat Pump Principles
 Lesson 4 Heat Pump Compressors
 Lesson 5 Flow Controls and Accessories
 Lesson 6 Heat Pump Electrical Systems
 Lesson 7 Heat Pump Electrical Components
 Lesson 8 Heat Pump Thermostats
 Lesson 9 Air-to-Air Heat Pump Defrost
 Lesson 10 Supplemental Electric Heat
 Lesson 11 Fossil Fuel Backup Heat
 Lesson 12 Water-Source Heat Pump Systems
 Lesson 13 Installing and Servicing Water-Source Heat Pumps
 Lesson 14 Heat Pump Performance Criteria
 Lesson 15 Heat Pump Performance Checks
 Lesson 16 Heat Pump Installation Procedures
 Lesson 17 Heat Pump Piping

VOLUME 2 CONTENTS:

Lesson 18 Electrical Troubleshooting
 Lesson 19 Troubleshooting Exercises
 Lesson 20 Refrigerant-Side Troubleshooting (Cooling Air-to-Air) Part 1
 Lesson 21 Refrigerant-Side Troubleshooting (Cooling Air-to-Air) Part 2
 Lesson 22 Refrigerant-Side Troubleshooting (Heating Air-to-Air) Part 1
 Lesson 23 Refrigerant-Side Troubleshooting (Heating Air-to-Air) Part 2
 Lesson 24 Troubleshooting Refrigerant Circuit Components
 Lesson 25 Troubleshooting Water-Source Heat Pumps
 Lesson 26 High-Efficiency Air-to-Air Heat Pumps
 Lesson 27 Water-Source Heat Pumps for Special Applications
 Lesson 28 Heat Load Calculations
 Lesson 29 Indoor Air Distribution
 Lesson 30 Duct Design
 Lesson 31 Diagnosing Air Flow Problems
 Lesson 32 Customer Relations
 Appendix Glossary of Terms

Item No.	Member Rate	Non-member Rate
760-900x Hard Copy ISBN: 978-1-61607-090-8	\$108	\$138
760-900e Digital Version ISBN: 978-1-61607-091-5	\$100	\$130
760-950x Instructor Edition Hard Copy ISBN: 978-1-61607-092-2	\$123	\$153
760-900z Paper Exam	Call Headquarters for Rate	\$50
Online Exam	TBA	TBA

RSES Technical Institute/CM Prep

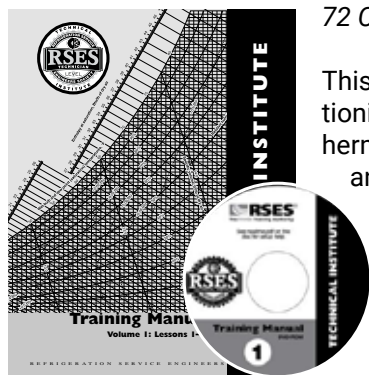
The RSES Technical Institute training manuals make up a comprehensive course of study designed to help Members who desire to attain the highest levels of technical competency within the HVACR industry. There are three training manuals designed to help RSES Members advance through the levels of the Technical Institute and prepare for the Certificate Member exam. The three manuals cover R/AC, electricity, heating and controls. Successful completion of any one Final Exam advances the Member one level. Please note that the three training manuals do not need to be taken in sequential order.

The RSES Technical Institute consists of six levels of technician competency and RSES membership is required for recognition at Levels I through V. It is recommended that Members who wish to advance through the Technical Institute enroll for all three of the Technical Institute Training Courses. However, members may “test out” at various levels. For example, an Active Member at Level I may take the final exam of any one of the three Training Manuals. Upon receiving a passing grade on the exam, the member would advance to Level II (Advance Tech). Members who pass the CM exam automatically advance to Level IV and successful CMS exam candidates advance to Level V.

RSES Technical Institute Levels of Competency	
Student (Student Technician)	Defined as any student Member currently pursuing the HVACR trade.
Level I (Technician)	Defined as any active RSES Member.
Level II (Advanced Tech)	Defined as an active RSES Member who has passed the Final Exam of any one of three Technical Institute Training Manuals.
Level III (Advanced Tech Level II)	Defined as an active RSES Member who has passed the Final Exam of any two of three Technical Institute Training Manuals.
Level IV (Advanced Tech CM)	Defined as an active RSES Member who has passed the CM Exam.
Level V (Mastertech Specialist)	Defined as an active RSES member who has passed one of the CMS Exams.

RSES Technical Institute Training Manual 1

72 CEHs, 7.2 CEUs



This manual begins with a comprehensive introduction to refrigeration and air conditioning. Topics covered include basic physics and major system components, including hermetic, semi-hermetic, and open compressors, as well as condensers, evaporators, and refrigerant-metering devices. It also covers fundamental concepts of electricity and magnetism as they pertain to resistors, conductors, power supplies, circuit protection devices, and transformers.

The instructor editions include lesson objectives (available online to review), lesson review questions/answers as well as references to where the answers to each question may be found in the lesson. A final exam for each manual is available through RSES Headquarters, which will deliver a completion certificate upon passing

for each student.

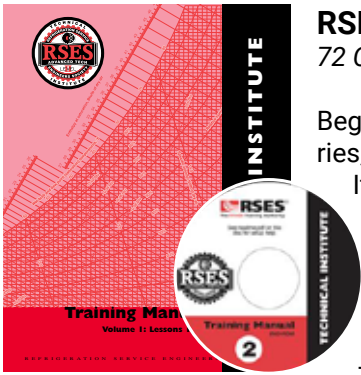
The interactive DVD edition or DVD only option turns approximately 400 pages of material into an interactive DVD that features audio lectures, colorful graphics, animation and interactive quizzes. This edition provides self-paced learning that is convenient anytime, anywhere. *Note: DVDs are formatted for computers, not DVD players.*

CONTENTS:

Lesson 1 Introduction to Refrigeration and Air Conditioning
Lesson 2 Basic Physics
Lesson 3 Major Component Functions

Lesson 4 Gas Laws (Part 1)
 Lesson 5 Gas Laws (Part 2)
 Lesson 6 Pressure/Temperature Relationship (Part 1)
 Lesson 7 Pressure/Temperature Relationship (Part 2)
 Lesson 8 The Compression Refrigeration Cycle (Part 1)
 Lesson 9 The Compression Refrigeration Cycle (Part 2)
 Lesson 10 The Compression Refrigeration Cycle (Part 3)
 Lesson 11 Refrigerant Tables
 Lesson 12 Refrigerant Properties and Characteristics
 Lesson 13 Refrigerant Designations
 Lesson 14 Safe Practices and Public Relations
 Lesson 15 Compressors
 Lesson 16 Open-Type Compressors
 Lesson 17 Hermetic and Semi-Hermetic Compressors
 Lesson 18 Air-Cooled Condensers
 Lesson 19 Water-Cooled Condensers
 Lesson 20 Refrigeration Evaporators
 Lesson 21 Capillary Tubes
 Lesson 22 Thermostatic Expansion Valves (Part 1)
 Lesson 23 Thermostatic Expansion Valves (Part 2)
 Lesson 24 Oil in Refrigeration Systems
 Lesson 25 Recover, Recycle, Reclaim
 Lesson 26 Safe Handling of Refrigerants and Cylinders
 Lesson 27 Fundamental Concepts of Electricity
 Lesson 28 Fundamental Concepts of Magnetism
 Lesson 29 Voltage = EMF = Potential Difference
 Lesson 30 Resistors and Resistance
 Lesson 31 Conductors
 Lesson 32 Power Supplies
 Lesson 33 Circuit Protection Devices
 Lesson 34 Electricity for the Service Technician (Part 1)
 Lesson 35 Electricity for the Service Technician (Part 2)
 Lesson 36 Electricity for the Service Technician (Part 3)
 Glossary of Terms

Item No.	Member Rate	Non-member Rate,
360-201x Hard Copy ISBN: 978-1-61607-094-6	\$108	\$138
360-251x Instructor Edition Hard Copy ISBN: 978-1-61607-106-6	\$123	\$153
360-311x Hard Copy w/Interactive DVD	\$158	\$188
360-351x Instructor Edition Hard Copy w/Interactive DVD	\$173	\$203
360-321d Interactive DVD Only	\$108	\$138
360-201z Paper Exam	Call Headquarters for Rate	\$50,
Online Exam	TBA	TBA



RSES Technical Institute Training Manual 2

72 CEHs, 7.2 CEUs

Beginning with the tools of the trade, this manual covers refrigeration system accessories, desiccants and driers, defrosting methods, refrigeration system controls, and piping. It also includes instruction on compressor replacement and system evacuation, electric motors in refrigeration systems, motor capacitors and protectors, thermostats, relays, contactors and starters, test equipment and troubleshooting, pressure and enthalpy diagrams, psychometrics, heat transfer, estimating heat loads, residential air conditioning, humidification and a review of safety codes.

The instructor editions include lesson objectives (available online to review), lesson review questions/answers as well as references to where the answers to each question may be found in the lesson. A final exam for each manual is available through RSES Headquarters, which will deliver a completion certificate upon passing for each student.

The interactive DVD edition or DVD only option turns approximately 400 pages of material into an interactive DVD that features audio lectures, colorful graphics, animation and interactive quizzes. This edition provides self-paced learning that is convenient anytime, anywhere. Note: DVDs are formatted for computers, not DVD players.

CONTENTS:

- Lesson 1 Trade Tools
- Lesson 2 Refrigeration System Accessories
- Lesson 3 Desiccants and Driers
- Lesson 4 Defrosting Methods
- Lesson 5 Refrigeration System Controls
- Lesson 6 Refrigeration System Piping (Part 1)
- Lesson 7 Refrigeration System Piping (Part 2)
- Lesson 8 Retrofits and Disposal Requirements
- Lesson 9 Compressor Replacement and System Evacuation
- Lesson 10 Motors
- Lesson 11 The Electric Motor in Refrigeration
- Lesson 12 Capacitors
- Lesson 13 Motor Capacitors and Protectors (Part 1)
- Lesson 14 Motor Capacitors and Protectors (Part 2)
- Lesson 15 Low-Voltage Thermostats
- Lesson 16 Relays, Contactors and Starters
- Lesson 17 Test Equipment (Part 1)
- Lesson 18 Test Equipment (Part 2)
- Lesson 19 Troubleshooting (Part 1)
- Lesson 20 Troubleshooting (Part 2)
- Lesson 21 Troubleshooting (Part 3)
- Lesson 22 Using Pressure and Enthalpy Diagrams (Part 1)
- Lesson 23 Using Pressure and Enthalpy Diagrams (Part 2)
- Lesson 24 Moisture in Air
- Lesson 25 Calculating Cooling Loads
- Lesson 26 Psychometrics
- Lesson 27 Heat Transfer (Part 1)
- Lesson 28 Heat Transfer (Part 2)
- Lesson 29 Estimating Heat Loads (Part 1)
- Lesson 30 Estimating Heat Loads (Part 2)
- Lesson 31 Room Air Conditioners
- Lesson 32 Types of Air Conditioning Systems
- Lesson 33 Residential Air Conditioning
- Lesson 34 Humidification (Part 1)
- Lesson 35 Humidification (Part 2)
- Lesson 36 Review of Safety Codes
- Glossary of Terms

Item No.	Member Rate	Non-member Rate
360-202x Hard Copy ISBN: 978-1-61607-095-3	\$108	\$138
360-252x Instructor Edition Hard Copy ISBN: 978-1-61607-107-3	\$123	\$153
360-312x Hard Copy w/Interactive DVD	\$158	\$188
360-352x Instructor Edition Hard Copy w/Interactive DVD	\$173	\$203
360-322d Interactive DVD Only	\$108	\$138
360-202z Paper Exam	Call Headquarters for Rate	\$50
Online Exam	TBA	TBA



RSES Technical Institute Training Manual 3

72 CEHs, 7.2 CEUs

This manual begins with comprehensive introduction to heat pump theory, including water-source heat pumps. Topics covered include computer-room environmental control, economizers, fans and blowers, air filtration and distribution, evaporative condensers and cooling towers, water treatment, multiple-rack systems, hydronics, troubleshooting, controls and controls components, pneumatic relays, typical control applications, and control maintenance.

The instructor editions include lesson objectives (available online to review), lesson review questions/answers as well as references to where the answers to each question may be found in the lesson. A final exam for each manual is available through RSES

Headquarters, which will deliver a completion certificate upon passing for each student.

The interactive DVD edition or DVD only option turns approximately 400 pages of material into an interactive DVD that features audio lectures, colorful graphics, animation and interactive quizzes. This edition provides self-paced learning that is convenient anytime, anywhere. Note: DVDs are formatted for computers, not DVD players.

CONTENTS:

- Lesson 1 Basic Heat Pump Theory (Part 1)
- Lesson 2 Basic Heat Pump Theory (Part 2)
- Lesson 3 Water-Source Heat Pumps
- Lesson 4 Computer Room Environmental Control
- Lesson 5 Economizer Systems (Part 1)
- Lesson 6 Economizer Systems (Part 2)
- Lesson 7 Fans and Blowers (Part 1)
- Lesson 8 Fans and Blowers (Part 2)
- Lesson 9 Air Filters and Electrostatic Cleaning
- Lesson 10 Air Distribution (Part 1)
- Lesson 11 Air Distribution (Part 2)
- Lesson 12 Air Distribution (Part 3)
- Lesson 13 Evaporative Condensers and Cooling Towers
- Lesson 14 Water Treatment (Part 1)
- Lesson 15 Water Treatment (Part 2)
- Lesson 16 Closed-Circuit Water Coolers

Lesson 17 Air-Cooled Condensing Unit Room Requirements
 Lesson 18 Heat Transfer Coils
 Lesson 19 Multiple Rack Systems
 Lesson 20 Hydronics (Part 1)
 Lesson 21 Hydronics (Part 2)
 Lesson 22 Hydronics (Part 3)
 Lesson 23 Troubleshooting (Part 1)
 Lesson 24 Troubleshooting (Part 2)
 Lesson 25 Controls Components and Variables
 Lesson 26 Types of Control Systems
 Lesson 27 Specifications
 Lesson 28 Sensors
 Lesson 29 Basic Control Theory
 Lesson 30 Air Supply Equipment (Part 1)
 Lesson 31 Air Supply Equipment (Part 2)
 Lesson 32 Thermostats and Controllers (Part 1)
 Lesson 33 Thermostats and Controllers (Part 2)
 Lesson 34 Pneumatic Relays
 Lesson 35 Typical Control Applications
 Lesson 36 Control System Maintenance
 Glossary of Terms

Item No.	Member Rate	Non-member Rate
360-203x Hard Copy ISBN: 978-1-61607-096-0	\$108	\$138
360-253x Instructor Edition Hard Copy ISBN: 978-1-61607-108-0	\$123	\$153
360-313x Hard Copy w/Interactive DVD	\$158	\$188
360-353x Instructor Edition Hard Copy w/Interactive DVD	\$173	\$203
360-323d Interactive DVD Only	\$108	\$138
360-203z Paper Exam	Call Headquarters for Rate	\$50
Online Exam	TBA	TBA



RSES Technical Institute Training Manual Complete Series*

The RSES Technical Institute Training Manual Complete Series includes all three manuals and options for their coordinating products.

The instructor editions include lesson objectives (available online to review), lesson review questions/answers as well as references to where the answers to each question may be found in the lesson. A final exam for each manual is available through RSES Headquarters, which will deliver a completion certificate upon passing for each student.

The interactive DVD edition or DVD only option turns approximately 400 pages of material into an interactive DVD that features audio lectures, colorful graphics, animation and interactive quizzes. This edition provides self-paced learning that is convenient anytime, anywhere. Note: DVDs are formatted for computers, not DVD players.

Item No.	Member Rate	Non-member Rate
360-700x Hard Copy	\$270	\$351
360-750x Instructor Edition Hard Copy	\$310	\$391
360-800x Hard Copy w/Interactive DVDs	\$445	\$504
360-850x Instructor Edition Hard Copy w/Interactive DVDs	\$485	\$526
360-323d Interactive DVDs Only	\$270	\$351

*Pricing reflects a 10% discount.



RSES CM Prep Course

A comprehensive study program developed by RSES Members for fellow Members to earn their Certificate Member (CM) credentials.

Based on successful local Chapter classes, the CD contains PowerPoint slides designed to review key subjects in each of the 18 CM exam categories. Drawing directly from material in the RSES Technical Institute manuals, the CDs can be used either by local chapters for group study or by individual members studying on their own.

Includes review quizzes for each lesson (lessons revealed in SlideShow format), reinforcing concepts and materials reviewed. There are 16 folders on the CD, each containing the PowerPoint file, the lesson quiz in pdf format, and any tables, charts, or formulas needed by the student in preparation for the exam.

Note: The CM Prep Course is reserved for RSES Members and Chapters only.

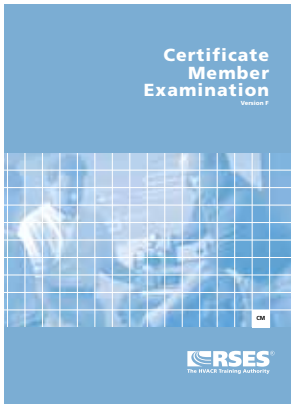
Item No.	Member Rate	Non-member Rate
360-550x CD ISBN: 978-1-61607-186-8	\$15	NA

RSES CM/SM/CMS Designations/Exams

As an employer, the CM, SM and CMS designations mean they are getting an employee with superior knowledge. As an employee, these classifications mean prestige. Exclusive to RSES Members, the Certificate Member (CM), Specialized Member (SM) and Certificate Member Specialist (CMS) designations are earned after passing rigorous exams.

All successful CM, SM and CMS candidates receive a wall certificate indicating their new status in the organization suitable for framing. In addition, all future correspondence includes the CM, SM or CMS designation with the Member's name, and the Member is encouraged to use the designation outside of RSES as well. At the Member's request, RSES can reach out to their employer announcing the successful passing of the exam. In addition, the names of successful candidates are included in *RSES Journal*, as well as listed in press releases and eBlasts sent to industry peers and publications.

Note: CM, SM and CMS exams require a proctor to oversee the exam and, upon passing, require active membership within RSES and CEHs/CEUs to maintain. Complete details on number of CEHs/CEUs required is available at rses.org.



CM Designation

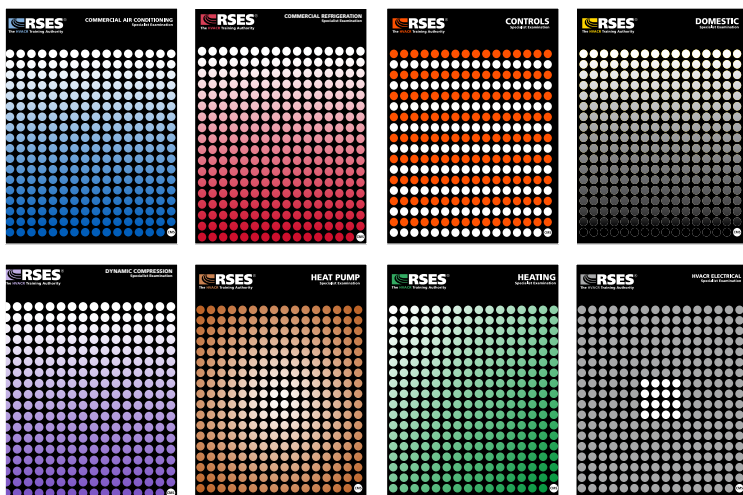
Originated in 1935, the CM designation means that the person earning this distinction has passed a rigorous exam that tests 18 categories of knowledge required in the installation and service of refrigeration and air conditioning equipment, including:

- Safety;
- A/C Evaporators;
- Metering Devices;
- Refrigeration Evaporators;
- Condensers and Cooling Towers;
- Air Distribution Equipment;
- Oils & Refrigerants;
- A/C Basics & Psychrometrics;
- Troubleshooting;
- Electrical;
- Commercial Refrigeration Load & Insulation;
- Air Cleaning, Filters;
- Piping;
- Refrigeration Principles;
- Humidifiers, Dehumidifiers, Pumps & Valves;
- Controls & Circuits;
- Compressors; and
- Accessories.

It requires a thorough understanding of the fundamentals of mechanical refrigeration theory, as well as working knowledge of installation, service and troubleshooting procedures.

Individuals who have achieved Certificate Member (CM) status have attained a special category of RSES membership. The RSES Certificate Member (CM) examination is 150 questions and requires a score of 70% or better to pass. Any active Member may take the exam. RSES International Headquarters keeps thorough records of the exams given and the results of each. Current pass rates are roughly 30%. RSES Certificate Members are recognized industry-wide as possessing high levels of HVACR knowledge. Many employers offer incentives for successful CM test completion.

Technical Institute Manuals 1, 2, and 3 provide a comprehensive course of study for those members who wish to obtain CM status.



SM/CMS Designation

Specialized Member (SM) and Certificate Member Specialist (CMS) designations are earned after successfully passing one (or more) rigorous written examinations, the latter of which is earned after first passing the CM exam.

There are currently eight exams, each focusing on a specialized area of expertise, including:

- Commercial Air Conditioning;
- Commercial Refrigeration;
- Controls;
- Domestic Service;
- Dynamic Compression;
- Heating;
- Heat Pump; and
- HVACR Electrical.

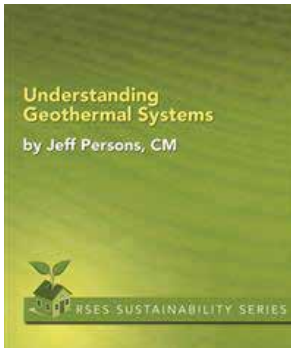
All successful CMS candidates receive two personalized wall certificates; one indicating their new status in the organization as a Certificate Member Specialist (CMS) and the other an RSES Technical Institute Level 5 certificate suitable for framing along with a patch promoting their new status.

During in-person RSES Conferences, the Imperial Award is granted In each Specialist category, to the Member with the highest score. Members who earn five of the eight currently available Specialist categories earn the Wayburn Wilson Award.

Item No.	Member Rate	Non-member Rate
500-501z CM Paper Exam	\$30	NA
500-502z CMS Paper Exam	\$35	NA
500-503z SM Paper Exam	\$35	NA
Online Exams	TBA	NA

Sustainability Series

Environmentally friendly, high-efficiency, alternative heating/cooling systems is yet another area where HVACR professionals need to be trained. The five titles available in the RSES Sustainability series offer a glimpse into what it takes to design, install and maintain more sustainable options, including radiant systems, systems with electronically commutated motors, and geothermal systems including specifics on ground-/water-source heat pumps and the heat exchangers within them.



Understanding Geothermal Systems

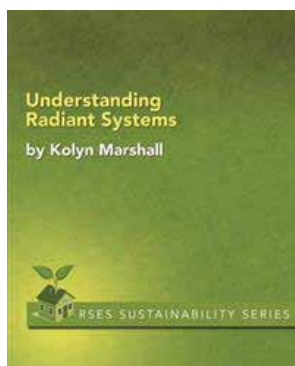
A comprehensive study and resource manual that serves as a “best practices” guide for the design, installation and maintenance of geothermal systems, this book draws on the author’s more than 30 years of hands-on geothermal field experience. The text covers geothermal systems and controls from their widespread introduction to the U.S. market in the early 1970s to the multistage ultra-high-efficiency systems of today. Study topics include both open-loop and closed-loop applications, subsurface geology, loop design, water chemistry, antifreeze solutions, system installation, and controls. Emphasis is placed on identifying common installation and service mistakes, and on learning from those mistakes.

This book gives business owners, sales staff, installers, and technicians a step up on the competition and imparts the knowledge necessary to maintain consumer confidence and appreciation. Geothermal systems represent one of the best means available for meeting the growing interest in renewable energy technology.

CONTENTS:

Chapter One Understanding Geothermal Systems
 Chapter Two Geothermal Site Considerations
 Chapter Three Open-Loop Systems
 Chapter Four Closed-Loop Systems
 Chapter Five Piping
 Chapter Six Loop Fill Solutions
 Chapter Seven Controls
 Chapter Eight Putting It All Together
 Appendix Information Resources

Item No.	Member Rate	Non-member Rate
200-521x Hard Copy ISBN: 978-1-61607-184-4	\$58	\$68
200-521e Digital Version ISBN: 978-1-61607-185-1	\$50	\$60



Understanding Radiant Systems

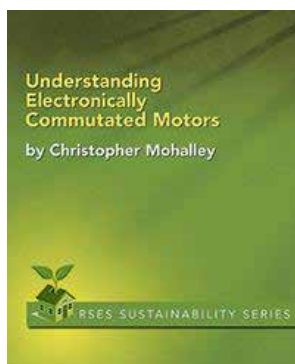
This manual is ideal for designers, installers and field technicians looking to understand more about radiant systems. This engineering resource and design manual serves as a comprehensive reference for the design, installation and maintenance of radiant systems, this book draws on the author's more than 18 years of hands-on design, troubleshooting, and field experience to deliver an in-depth look into the world of radiant heating. The text covers the history and function of radiant systems and controls from their use in ancient Roman baths to such modern applications as floor warming, floor heating, and snow melting. Study topics include system design, control strategies, water quality, and troubleshooting. Learn how common construction changes can impact the operation of a radiant system while discovering the simple "tweaks" that installers can use to optimize performance.

This book gives business owners, sales staff, installers, and technicians an inside look at radiant applications—both hydronic and electric—while imparting the knowledge necessary to maintain consumer confidence and appreciation. Find out why radiant systems are rapidly becoming the comfort choice of today.

CONTENTS:

Chapter One A Radiant Foundation
 Chapter Two Heat Transfer
 Chapter Three Tools of the Trade
 Chapter Four Floor Coverings
 Chapter Five The Radiant Panel
 Chapter Six Interior Installation Profiles
 Chapter Seven Design and Performance Characteristics
 Chapter Eight Mechanical Piping
 Chapter Nine Water Quality
 Chapter Ten Troubleshooting
 Chapter Eleven Other Radiant Applications

Item No.	Member Rate	Non-member Rate
200-522x Hard Copy ISBN: 978-1-61607-189-9	\$58	\$68
200-522e Digital Version ISBN: 978-1-61607-190-5	\$50	\$60



Understanding Electronically Commutated Motors

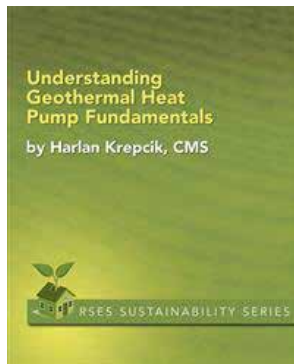
A comprehensive study and resource manual that serves as a fundamental building block to understanding electronically commutated motors (ECMs), this book draws on the author's more than 20 years of HVACR experience and extensive knowledge of ECMs. ECMs designed specifically for OEM (original equipment manufacturer) multistage indoor blower motor applications entered the HVACR industry in the late 1980s. Today they are utilized in all HVACR OEM motor applications, as well as a growing number of retrofit applications. This book starts at the beginning with a detailed outline of ECM theory, and goes on to discuss all HVACR ECM applications, designs, operational capabilities, diagnostics, and repair. The author covers the entire history and evolution of ECMs, including the most current advancements in technology and applications.

ECMs are an integral component in high-efficiency advanced comfort and refrigeration systems. In addition, ECMs play an important role in supporting the minimum-efficiency standards currently mandated in some OEM commercial refrigeration systems. ECMs are likely to be required in many more OEM HVACR applications in the not-so-distant future. Savvy business owners and homeowners are already replacing their induction motors in existing commercial refrigeration and HVAC indoor blower applications with retrofit ECMs, realizing the efficiency and comfort value they provide. Educators, trainers, distributors, sales staff, and technicians will find that this book provides the knowledge necessary to properly install, maintain, service, and retrofit HVACR systems with ECM technology.

CONTENTS:

Chapter One What is an ECM?
 Chapter Two ECM Usage in HVACR Applications
 Chapter Three Constant-Airflow ECMs
 Chapter Four Constant-Torque ECMs
 Chapter Five Constant-Speed ECMs

Item No.	Member Rate	Non-member Rate
200-523x Hard Copy ISBN: 978-1-61607-191-2	\$58	\$68
200-523e Digital Version ISBN: 978-1-61607-192-9	\$50	\$60

**Understanding Geothermal Heat Pump Fundamentals**

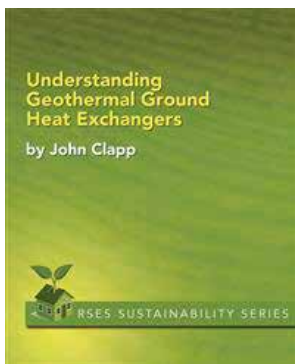
RSES' Understanding Geothermal Heat Pump Fundamentals manual is the second geothermal title to be released in the RSES Sustainability Series. This manual explains geothermal heat pumps and is designed to be a gateway to understanding this amazing technology. Geothermal heat pump systems are among the most energy-efficient technologies for providing comfort heating and cooling and domestic hot water heating. Water-source heat pumps, also covered in this book, are considered to be geothermal heat pumps as well, but they extract and dissipate heat by way of water instead of the ground.

Study topics include heat pump fundamentals, systems, principles, compressors, flow controls and accessories, electrical systems and components, thermostats, supplemental electric heat, water-source heat pump systems, heat pump piping, and troubleshooting water-source heat pumps.

CONTENTS:

Chapter One Heat Pump Fundamentals
 Chapter Two Heat Pump Systems
 Chapter Three Heat Pump Principles
 Chapter Four Heat Pump Compressors
 Chapter Five Flow Controls and Accessories
 Chapter Six Heat Pump Electrical Systems
 Chapter Seven Heat Pump Electrical Components
 Chapter Eight Heat Pump Thermostats
 Chapter Nine Supplemental Electric Heat
 Chapter Ten Water-Source Heat Pump Systems
 Chapter Eleven Installing and Servicing Water-Source Heat Pumps
 Chapter Twelve Heat Pump Piping
 Chapter Thirteen Troubleshooting Water-Source Heat Pumps

Item No.	Member Rate	Non-member Rate
200-524x Hard Copy ISBN: 978-1-61607-193-6	\$58	\$68
200-524e Digital Version ISBN: 978-1-61607-194-3	\$50	\$60



Understanding Geothermal Ground Heat Exchangers

This book focuses chiefly on the design and installation of the ground heat exchanger (GHX) in a geothermal heat pump (GHP) system. It spells out the steps required for a contractor to execute the basic design of a residential or light commercial GHX, and to carry that design forward into the layout, installation, testing, and operational phases of the system. Many different trades and contractors may be involved in installing ground heat exchangers. This book is intended for those piping, excavating, or HVAC contractors who perform the work of design, layout, and installation of a GHX only. Information will be limited to the actual HVAC mechanical portion of a GHP system as it relates to the design and performance of the ground heat exchanger.

Individuals reading this book should have a basic understanding of piping systems and excavation. Material presented in this book generally conforms to the “best practices” of the geothermal heat pump design and installation industry, and is not intended to be understood as presenting the only correct methods available. This book is written to allow individuals to better understand the steps involved in the design and installation of a GHP system.

CONTENTS:

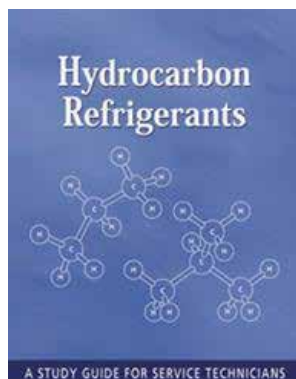
Chapter One Geothermal Heat Pump Fundamentals
 Chapter Two Preliminary Project Planning
 Chapter Three GHX Design
 Chapter Four Vertical GHX Piping
 Chapter Five Horizontal and Surface-Water GHX Piping
 Chapter Six GHX Supply/Return Piping Excavation and Installation
 Chapter Seven Piping for Building Entry and GHP Equipment Connection
 Chapter Eight GHX Piping System Air Removal Methods
 Chapter Nine Testing Flow and Pressure in GHX Piping Systems
 Chapter Ten Freeze Protection Methods for GHX Piping
 Chapter Eleven Backfilling Open Excavations and Project Completion

Item No.	Member Rate	Non-member Rate
200-525x Hard Copy ISBN: 978-1-61607-195-0	\$58	\$68
200-525e Digital Version ISBN: 978-1-61607-195-0	\$50	\$60

Refrigerant Certifications

One of the U.S. Environmental Protection Agency's (EPA) many duties is to oversee programs that protect the stratospheric ozone layer. Section 608 and 609 of the Clean Air Act enforces activities that protect the ozone layer as they apply to refrigeration and air conditioning systems. Under this program, certification is required to ensure that technicians measure up to a variety of EPA requirements on service practices and refrigerant reclamation. The RSES Educational Foundation is approved by the EPA to administer Section 608 certification testing.

In addition to the EPA 608, RSES offers additional refrigerant training and certification programs in order to provide additional safety protocol around specific refrigerants in the marketplace that have very specific handling requirements.



Hydrocarbon Training Study Guide

8 CEHs, 0.8 CEUs

Hydrocarbon refrigerants were approved for use by the US EPA through their SNAP program in early 2012, for specific refrigeration applications. The course covers practices for the following refrigerant families:

- HC R-290 (propane)
- HC R-600a (isobutene)
- HC R-441A (a blend*)
- HC R-170 (ethane)
- HFC R-32 (difluoromethane)

Now in its third edition, the Hydrocarbon Training Study Guide covers everything you need to know to work safely with flammable refrigerants, including EPA Regulations; UL Standards; Refrigerant Safety; Service Procedures; and much more.

RSES highly recommends only experienced refrigeration professionals handle HCs. You should already have a solid understanding of the refrigeration cycle and proper handling of CFC, HCFC and HFC refrigerants.

CONTENTS:

Introduction to Hydrocarbon Refrigerants
 Regulations and Standards
 Refrigerant Safety
 Compressor Terminal Venting
 Compressor Change-Out (Defective Compressor)
 System Flushing, Purging, and Pressure-Testing for Leaks
 Proper Evacuation Techniques
 Compressor Misuse
 Compatibility
 Service Procedures, Maintenance, and
 Refrigerant Handling
 The Refrigeration Cycle
 Appendix A SNAP Regulations: Substitutes Subject To Use Restrictions
 Appendix B Maximum Design Charge Sizes (Tables)
 Appendix C Temperature-Pressure Charts for Refrigerants
 Appendix D Refrigerant Properties
 Appendix E Refrigerant Characteristics
 Appendix F Temperature and Pressure Conversion Tables

Item No.	Member Rate	Non-member Rate
111-203x Hard Copy ISBN: 978-1-61607-206-3	\$53	\$58
111-203e Digital Version ISBN: 978-1-61607-207-0	\$45	\$50



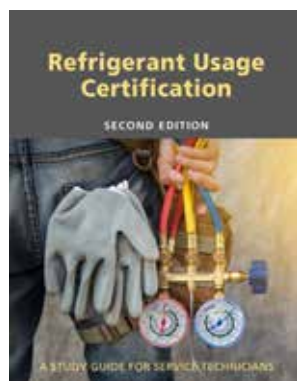
Hydrocarbon Refrigerants Training eLearning Course

8 CEHs, 0.8 CEUs

This eLearning course follows the same lessons listed in the book, and includes a narrated online presentation highlighting key topics from the study guide. A certificate test that assesses your understanding of the materials is also available. A certificate of completion for 8 CEHs/0.8 CEUs becomes available after the successful completion of the quiz. The

course may be bundled (Full Course) with the exam or purchased on its own.

Item No.	Member Rate	Non-member Rate
800-405e Full Course	\$120	\$140
800-406e Exam Only	\$40	\$50
Group Rates Available	Call Headquarters for Rates	



Following the structure of EPA's Section 608 program, Refrigerant Usage Certification Study Guide-Second Edition (2019) is broken down into Core, Type I (small appliances), Type II (High-pressure systems) and Type III (Low-pressure systems). Allows focused study in specific area of certification being sought. Contains many updated refrigerants, dates and timelines for phaseouts, etc.

CONTENTS:

Core: general knowledge
Ozone depletion
Health and Environmental
Early Controls on CFCs
The Montreal Protocol
U.S. Clean Air Act Amendments
Harmful Effects of Chlorine
Global Warming
Refrigerant

Refrigerant Blends
Refrigerant Oils
ASHRAE Standard 15
Refrigeration Cycle
"The Three Rs"
Options
Refrigerant Recovery Methods
Leak Detection
Dehydration
Refrigerant Safety
Refrigerant Cylinders

Type I: Small Appliances
Definitions
Recovery
Refrigeration Cycle
Safety

Type II: High-pressure Systems
Equipment Categories
Leak Detection
Verification Testing
Recovery
Refrigeration Cycle
Safety

Type III: Low-pressure Systems
Leak Detection
Verification Testing
Recovery
Recharging Techniques
Refrigeration Cycle
Retrofits
Safety

Appendix: Temperature-Pressure Charts

Note: The EPA 608 exam is closed book and requires a proctor to oversee the exam.

Item No.	Member Rate	Non-member Rate
111-101x Hard Copy ISBN: 978-1-61607-209-4	\$30	\$33
111-101e Digital Version ISBN: 978-1-61607-210-0	\$25	\$30
111-102z Paper Exam	\$40	\$40
Online Exams	TBA	TBA



Low GWP Refrigerant Safety: Flammable and Mildly Flammable Refrigerants

As the HVACR industry continues to move forward and innovate, the refrigerants that were once so commonplace are now being phased out. Replacing them are more energy efficient, environmentally friendlier refrigerants, known as Low GWP refrigerants. Many of these new refrigerants are classified by ASHRAE as A2L, or slightly flammable. The industry is also seeing expanded use of some hydrocarbon (A3) refrigerants, such as propane and isobutane. Students and technicians can and should acquire additional training for the safe handling and transportation of these refrigerants.

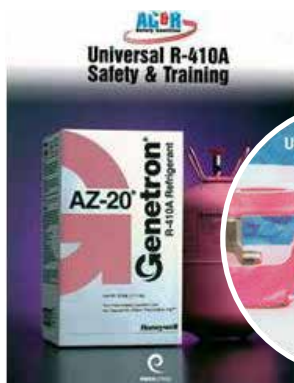
This eLearning course available on The HVACR Learning Network follows the same lessons listed in the book, and includes video lectures to help you hear and understand the concepts and content being presented.

The instructor resource materials include two PowerPoint presentations (one for each Section), 208 slides in all, that correlate directly with the training manual. Each slide within the presentation contains speaker notes that are designed to aid the instructor through the presentation and provide additional talking points.

CONTENTS:

- Refrigerant safety
- Introduction to Low GWP refrigerants
- Refrigerant properties and characteristics
- The refrigeration cycle
- Working with refrigerant blends
- Proper installation and service guidelines
- Flammable refrigerant considerations
- Explanation of the associated codes and standards for A2L refrigerants

Item No.	Member Rate	Non-member Rate
LGRSPM Hard Copy ISBN: 978-1-61607-209-4	\$38	\$47.95
LGRSPPT Instructor Resource CD ISBN: 978-1-61607-210-0	\$68	\$93.25
eLearning Course	Visit hvacr.elearn.network for pricing.	



Universal R-410A Safety & Training/CD

Because R-410A operates at considerably higher pressures than many other refrigerants, newly manufactured R-410A systems require service professionals to use different tools and equipment. This book explains why R-22 systems cannot be retrofitted to R-410A, and why each component in an R-410A system must meet the stringent demands of this newer refrigerant. The manual covers background, system fundamentals, refrigerant chemistry, refrigerant oils, safety, and a practice exam to prepare professionals for the certification exam.

An interactive CD correlates directly with the manual or can be utilized as a unitary program. It contains all of the information necessary to prepare for the R-410A Safety Certification exam.

CONTENTS:

Appropriate Refrigerant/Oil Applications
Service Techniques
Safe Handling/Recovery of R-410A and R-407C

Item No.	Member Rate	Non-member Rate
200-410a Hard Copy	\$33	\$36
200-410x Digital Version	\$33	\$36
410-000x Paper Exam	\$30	\$35
Online Exams	TBA	TBA



R-410A and R-22 Systems Air Conditioning Service Guide

Now in its Second Edition, this training manual is a comprehensive reference for servicing R-22/R-410A residential split air conditioning systems. Step-by-step service procedures and quick-reference diagrams will help guide technicians through troubleshooting and service.

CONTENTS:

- Mechanical Refrigeration Cycle Basics
- Refrigerants and Oils
- Superheat
- Subcooling and Condensers
- Refrigerant Piping
- Charging
- Diagnosing Refrigeration Circuit Problems
- High Voltage Circuit
- Compressors
- ECM Blower Motors
- PSC Motors
- Air Volume

Item No.	Member Rate	Non-member Rate
900-001x Hard Copy ISBN: 978-1-930044-87-6	\$39.57	\$65.95

SAFETY

Considering the risk for personal injury that HVACR professional are regularly exposed to—be it from simply opening a unit, charging a system or merely handing a customer the bill—basic safety and personal protective equipment are important components to consider. RSES offers several safety-related manuals and online courses to keep students, technicians, contractors and facility managers alive and well in the field. Safety should not be considered job specific, but rather a part of the basic foundation that comes with servicing equipment. Shortcutting to save time or a walk back to the truck is simply not worth the personal injury that could result.



Safety for the HVACR Service Technician/Instructor CD

This manual provides a single source for the many various safety materials that RSES has developed specifically for the HVACR service technician. The information presented in this publication includes numerous safety facts, guidelines, and recommendations. However, the suggestions made are, for the most part, general in their meaning and may not be applicable to all situations or conditions.

An instructor CD features Microsoft PowerPoint presentations and a bank of test questions to help reduce the preparatory work required for teaching a course in safety. The CD's bank of test questions (utilizing Microsoft Word) contains a minimum of 10 multiple-choice questions per chapter. HVACR instructors and trainers have the flexibility to use the questions as either chapter review questions, or combined as a comprehensive final exam. In addition, the CD also provides thorough slide notes to guide HVACR instructors and trainers through the presentation.

ter review questions, or combined as a comprehensive final exam. In addition, the CD also provides thorough slide notes to guide HVACR instructors and trainers through the presentation.

CONTENTS:

- Chapter 1 Introduction to Safety
- Chapter 2 Types of Accidents
- Chapter 3 Job Site Safety
- Chapter 4 Personal Protective Equipment
- Chapter 5 Tools and Test Instruments
- Chapter 6 Electrical Safety
- Chapter 7 Fan Safety
- Chapter 8 Refrigerants and Other Gases
- Chapter 9 Handling Cylinders Safely
- Chapter 10 Soldering, Brazing, and Welding
- Chapter 11 Fire Safety
- Chapter 12 Ladders, Scaffolds, and Lifts
- Chapter 13 Material Handling
- Chapter 14 First Aid

Item No.	Member Rate	Non-member Rate
200-104x Hard Copy ISBN: 978-1-61607-133-2	\$43	\$58
200-104e Digital Version ISBN: 978-1-61607-136-3	\$35	\$50
200-105x Instructor CD	\$43	\$58



Safety for the HVACR Service Technician eLearning Course

16 CEHs, 1.6 CEUs

This eLearning course provides a comprehensive introduction explaining numerous safety facts, guidelines and recommendations for the HVACR service technician. The course is intended to provide students and practicing technicians with safety information and knowledge related to personal protective equipment. These courses are not intended as a sole source of training for HVACR technicians.

The modules that make up this course most directly resemble content within Safety for the HVACR Service Technician manual.

A final exam is provided after each module and a certificate of completion is automatically generated after successfully passing each one. The course may be purchased in its entirety or by individual modules and is available for 365 days after purchases. The full course includes:

- Module 1 PPE
- Module 2 Tools and Test Instruments
- Module 3 Electrical Safety
- Module 4 Fan Safety
- Module 5 Soldering, Brazing and Welding
- Module 6 Fire Safety
- Module 7 Ladders, Scaffolds and Lifts
- Module 8 Material Handling

Item No.	Member Rate	Non-member Rate
800-100e Full Course	\$150	\$200
800-101e Module 1	\$40	\$55
800-102e Module 2	\$40	\$55
800-103e Module 3	\$40	\$55
800-104e Module 4	\$40	\$55
800-105e Module 5	\$40	\$55
800-106e Module 6	\$40	\$55
800-107e Module 7	\$40	\$55
800-108e Module 8	\$40	\$55
Group Rates Available	Call Headquarters for Rates	



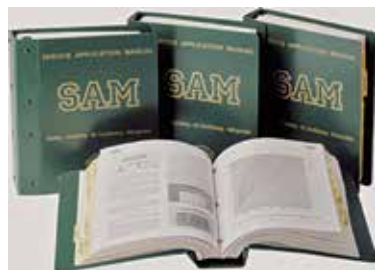
Carbon Monoxide a Clear and Present Danger

This book is designed to provide an understanding of the hazards inherent in carbon monoxide generation, testing procedures, an overview of combustion analysis and the relation of building pressures to carbon monoxide generation. The training manual is broken into three sections: Section 1-Carbon Monoxide (CO) Explains; what CO is, how CO is produced, health effects of CO exposure, how to respond an alarm, basic testing procedures, code compliance and exposure standards. Section 2-Combustion: An in depth explanation combustion analysis, troubleshooting and remediation of CO production for both gas and oil fired appliances such as; boilers, furnaces, hot water heaters, clothes dryers, etc. Section 3-Pressure Measurements: A primer on how building pressures effect the distribution of carbon monoxide.

Item No.	Member Rate	Non-member Rate
210-101x Hard Copy ISBN: 1-930044-20-8	\$34.97	\$52.95

Reference Manuals/Specialty Publications

In addition to supplying its own reference manuals, RSES also offers other association's and organization's reference publications needed to do a variety of day-to-day tasks within the HVACR field. Discounts are extended to RSES Members courtesy of each respective company.



Service Application Manual (SAM)

SAM (Service Application Manual) is an excellent resource for RSES Members to use to acquire the broad-based competence needed for success in the HVACR industry. SAM is the oldest living reference manual available that contains literally thousands of pages of technical data, equipment analyses and evaluations, field application instruction, regulations, good practice codes, business development guidance and more. RSES Members can access hundreds of SAM chapters available online, but be sure to log in to view the chapters

Members can search through SAM online by using the SAM Search menu on the left, reviewing the Table of Contents available on the site, or simply by navigating through the sections listed in the menu to the left. SAM is organized into the following 25 main categories with subcategories to make finding the information easier:

- Refrigeration
- Refrigerants
- Moisture in Air
- Electricity
- System Components
- Motors
- Controls
- Air Conditioning
- Ice Makers
- Heat Loads
- Airflow
- Residential Heating and Cooling Systems
- Mathematics, Tables & Charts
- Business Administration
- Safety and First Aid
- Standards
- Air and Water Treatment
- Heat Pump Systems
- Chillers
- Boilers
- Soldering, Brazing, and Welding
- Service
- Specialized Heating and Cooling Equipment
- Tools and Indicating and Recording Instruments
- Energy Conservation

SAM (the Service Application Manuals) is also available on CD. All of the current Service Application (SAM) chapters compiled onto one PDF. While SAM is a benefit of membership and members can access the SAM Chapters for no charge through the members only section of the RSES website, Members and non-members can access the material via CD any where, any time.

Go to www.rses.org/SAM.aspx to view the Table of Contents and a sample Chapter.

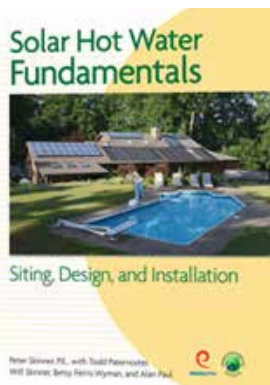
Item No.	Member Rate	Non-member Rate
640-500x CD	\$28	\$213



HVACR Quick-Reference Handbook

This handbook contains many frequently used equations, conversion charts, tables, and other reference materials, including an extensive glossary of industry terms, symbols used in electrical schematics and piping layouts, and many refrigerant P-T charts.

Item No.	Member Rate	Non-member Rate
360-102x Hard Copy ISBN: 978-1-61607-132-5	\$38	\$56
360-102e Digital Version ISBN: 978-1-61607-135-6	\$30	\$48



Solar Hot Water Fundamentals

Contains everything you need to know to become a professional solar designer and installer. This comprehensive training manual includes: site analysis, design and installation of: drainback systems, closed loop glycol systems, thermosiphon systems, pool heating systems, solar hot water components, solar thermal loops, lad integration and combi-systems, roofing plumbing tanks and heat exchangers, pumps and fluids, collector mounting, system controls, performance and monitoring, troubleshooting and maintenance, codes and regulations, safety, and it contains hundreds of custom system schematics and full-color images

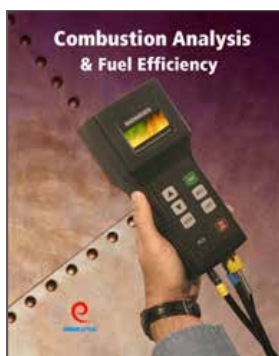
Item No.	Member Rate	Non-member Rate
210-104x Hard Copy ISBN: 978-0-9833552-0-5	\$41.97	\$69.97



System Performance: Maximizing Energy Efficiency in Heating and Cooling

Residential energy studies show that: 68% of residential systems are improperly charged, 70% have improper air flow and 91% have not had a combustion efficiency check performed. The System Performance training manual aids technicians in understanding the proper techniques and procedures used to verify and optimize performance of HVAC systems. The manual is broken into four parts covering: airflow, critical charging procedures, psychrometrics, and combustion efficiency. Persons who have finished reading this book can demonstrate their retained knowledge to: reduce warranty cost, reduce call backs and maximize the energy efficiency of heating and cooling equipment, by taking the System Performance Certification exam. Book and examination sold separately or bundled.

Item No.	Member Rate	Non-member Rate
210-102x Hard Copy ISBN: 1-930044-31-3	\$34.17	\$56.95



Combustion Analysis & Fuel Efficiency

Purchasing new high efficient equipment will not necessarily reduce the cost of heating and cooling a home. Energy efficiency is not simply purchasing a new high SEER system, is about proper installation to manufactures specifications. A quality installation will save energy and money. The Annualized Fuel Utilization Efficiency (AFUE) rating provides the consumer with a number that represents the percentage of fuel efficiency achievable by gas and oil fired furnaces and boilers. How can a HVACR service technician verify that they have properly installed or serviced a system the manufacturers specified AFUE rating? This can only be accomplished through combustion analysis, an essential aspect of furnace and boiler efficiency.

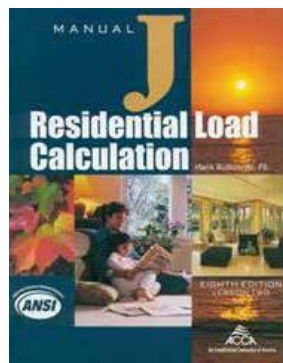
This manual addresses: carbon dioxide formation and release, carbon monoxide generation, thermal heat transfer, and flame temperature. The manual includes steps and procedures to increase efficiency and reduce emissions are also included. Readers should expect to increase their knowledge of the combustion process and combustion control. Topics such as the dynamics of carbon dioxide production, the release of heat, and the oxygen relationship are discussed.

Item No.	Member Rate	Non-member Rate
210-101x Hard Copy ISBN: 1-930044-25-9	\$34.97	\$52.95

ACCA Manual J8 Abridged Edition

MJ8AE is an abridged version of the Eighth Edition of Manual J, which provides complete instructions for estimating heat loss and heat gain for residential structures. MJ8AE is sufficient for learning the Manual J procedures and for undertaking hand calculations on a varied number of home calculations. New homes, homes that had significant upgrades or modifications, or homes that have non-standard design elements should use the comprehensive procedure of the unabridged version of Manual J, Eighth Edition.

Item No.	Member Rate	Non-member Rate
200-008x Hard Copy ISBN: 9781892765284	\$67	\$97

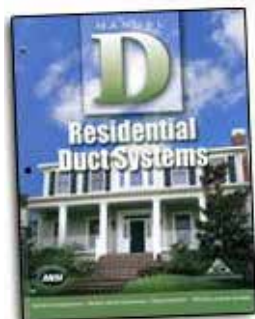


ACCA Manual J: Residential Load Calculation Eighth Edition – Version Two

RSES offers the ever-popular Manual J to its members. Published by Air Conditioning Contractors of America (ACCA), Version Two reorganizes the presentation of material provided in previous versions, and provides guidance on using an abridged version of Manual J (MJ8AE), which supports hand calculations for a subset of Manual J applications.

The Eighth Edition of Manual J (MJ8TM – ACCA/ANSI) is the American National Standard for residential heating and cooling calculations.

Item No.	Member Rate	Non-member Rate
200-008x Hard Copy ISBN: 9781892765352	\$127	\$167



ACCA Manual D

Design a residential duct system in less time with the streamlined Manual D duct procedure. The newly released Manual D has been significantly revised to include:

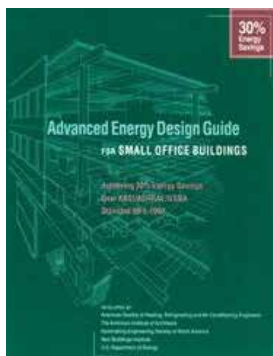
- Updated and expanded VAV guidance, with detailed examples.
- Impacts of excess length, sag and compression in flexible ducts.
- New equivalent length values for flex duct junction boxes.

Manual D provides:

- A single set of ANSI-recognized duct sizing principles and calculations that apply to all duct materials
- System operating point (supply Cfm and external static pressure), and airway sizing for single-speed and multi-speed (ECM) blowers
- A method for determining the impact of duct friction and fitting pressure drop on blower performance and air delivery
- The most comprehensive equivalent length data ever published.

You can apply the Manual D procedure to constant volume systems and zoned variable air volume systems, over a full range of duct construction materials. Manual D includes a number of informative appendices related to air distribution systems (e.g., equipment and air-side components, controlling excess air when VAV dampers close, duct loads, duct leakage and duct system efficiency, air quality issues, noise control, minimum air velocity for ducts; codes, standards and best practice issues; and commissioning issues).

Item No.	Member Rate	Non-member Rate
200-009x Hard Copy ISBN: 9781892765505	\$80	\$94



Advanced Energy Design Guide For Small Office Buildings

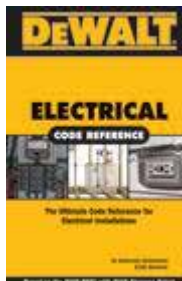
This book provides a sensible approach to developing energy-efficient buildings by including practical products and readily available, “off-the-shelf” technology. It offers you all the tools you need to create an energy-efficient building—one that achieves energy savings of 30% compared to buildings that meet only the minimum requirements of Standard 90.1.

This four-color guide presents a simple approach to energy design for contractors and designers of office buildings of up to 20,000 square feet. Ideal for the contracting, design, and remodeling industries, this peer-reviewed manual features a user-friendly format and contains “how-to” guidance for building owners on reaping the benefits of energy savings while maintaining quality and functionality of the office space.

This book contains recommendations only—it is not a minimum code or standard. It is designed to be used in addition to the existing codes and standards, not to circumvent them.

Item No.	Member Rate	Non-member Rate
200-092x Hard Copy ISBN: 9781931862554	\$55	\$67

DeWalt Reference Books Note: Several of the DeWalt Reference Series books sold by RSES have been updated and more current versions are available at the DeWalt website. What remains in stock at RSES will be sold and removed from inventory.



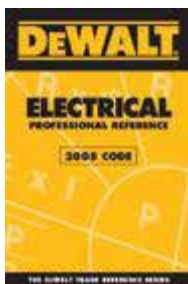
DeWalt Electrical Code Reference

An absolute must-have for anyone working with residential electrical systems, the DEWALT® Electrical Code Reference will provide users with 80 pages of illustrated code requirements, violations, and installation concerns. Based on the 2008 National Electrical Code®, this book covers everything from branch circuits to panel board wiring to conductor ampacity tables and more. With a compact format that fits perfectly in a toolbox and a quick-reference format that makes important information easy to find, this book is the perfect job site companion.

Features:

- Special cover material is flexible, tear-resistant, and water-and-oil resistant for ease of use in a shop or under the toughest job site conditions.
- Exclusive super-strong binding allows the books to lay flat when opened while keeping the pages securely intact.
- Full-color illustrations clarify key concepts and procedures.
- Authored by an industry leader in contractor education.
- Compact size and easy-to-use quick reference format puts “must-know” information at readers’ fingertips readily, for on-the-job success.
- Content is completely current and up-to-date with industry standards.

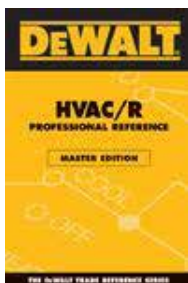
Item No.	Member Rate	Non-member Rate
200-101a Hard Copy ISBN: 9780977718368	\$24	\$28



DeWalt Electrical Professional Reference

The DEWALT® Electrical Professional Reference is one of the most comprehensive resource guides available and is a vital tool for anyone working in the industry. It contains valuable, time-saving information on formulas and laws, lighting, wire capacity, low voltage, conduit and box fill, symbols, raceways and wiring specifications, conversions, abbreviations, motors, definitions, overload protection, materials, transformers, tools and more. Pocket Size: 4"X6", 384 pages.

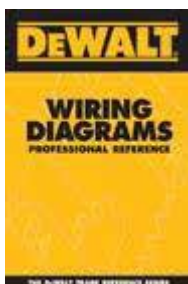
Item No.	Member Rate	Non-member Rate
200-101c Hard Copy ISBN: 9780979740374	\$24	\$28



DeWalt HVAC/R Professional Reference - Master Edition

The DeWalt® HVAC/R Professional Reference expanded edition contains approximately twice as much information as our earlier HVAC reference book. This comprehensive jobsite solution for HVAC/R technicians covers formulas, design data, heating, ventilation, piping, service, troubleshooting, electrical motors and much more. Pocket Size: 4"X6", 768 pages.

Item No.	Member Rate	Non-member Rate
200-101d Hard Copy ISBN: 9780977000388	\$28	\$33



DeWalt Wiring Diagrams Professional Reference

The DeWalt® Wiring Diagrams Professional Reference is a must have for anyone installing or replacing electrical wiring. This book is packed with hundreds of easy-to-follow diagrams covering outlets and switches, electrical service, lighting, power distribution, transformers, overload protection, motors and controls, grounding and bonding, wiring guidelines and specifications, low voltage, hazardous locations and more. Pocket Size: 4"X6", 384 pages.

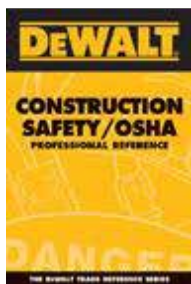
Item No.	Member Rate	Non-member Rate
200-101e Hard Copy ISBN: 9780975970973	\$24	\$28



DeWalt Blueprint Reading Professional Reference

The DeWalt® Blueprint Reading Professional Reference is a powerful reference tool for plumbers, carpenters, roofers, electricians, flooring installers, HVAC technicians, MRO staff or any other trade professional. This resource is fully illustrated with a multitude of real blueprint sections and symbols broken down by the specific trades. Pocket Size: 4"X6", 384 pages.

Item No.	Member Rate	Non-member Rate
200-101h Hard Copy ISBN: 9780977000357	\$24	\$28



DeWalt Construction Safety/OSHA Professional Reference

The DeWalt® Safety/OSHA Professional Reference contains all of the essential safety requirements for construction job sites in the United States. It addresses scaffolding, ladders, fall protection, protective equipment, electrical, working in trenches, demolition, safety plans, forms, and much more. It also includes forms and plans that comply with OSHA rules. Pocket Size: 4"X6", 384 pages

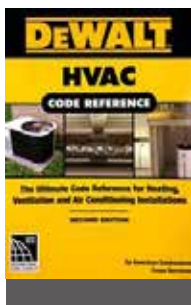
Item No.	Member Rate	Non-member Rate
200-101i Hard Copy ISBN: 9780977718337	\$24	\$28



DeWalt HVAC Professional Reference

With regards to various aspects of installation, service, testing, and balancing, the DEWALT® HVAC Professional Reference is the number one pocket reference guide for the HVAC industry. Comprehensive coverage includes compressors, duct sizing, heat transmission conversion factors, temperature and pressure, fans, air velocities, refrigeration characteristics, thermostats, and much more. Compact but powerful, this handy pocket reference helps service technicians become experts on the job!

Item No.	Member Rate	Non-member Rate
200-101j Hard Copy ISBN: 9780975970942	\$24	\$28



DeWalt HVAC Code Reference - Second Edition

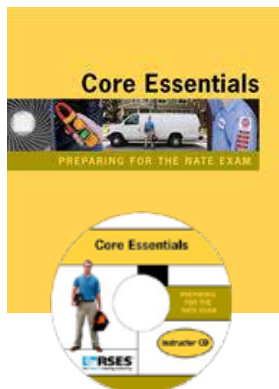
Get your next HVAC job done right—the first time—with this must have reference guide from an industry leader in contractor resources. The DeWalt® HVAC Code Reference uses the 2015 International Mechanical Code® and the 2015 International Residential Code® as the foundation for providing readers with the knowledge and skills needed to install or modify HVAC equipment successfully. It illustrates hundreds of the most common code requirements, violations, and installation concerns providing the critical information needed to get the job done right. Topics covered include: materials and duct construction; chimneys; vents; grease duct systems; propane tanks; load calculations; exhaust systems; fireplaces; and much more.

Item No.	Member Rate	Non-member Rate
200-101k Hard Copy ISBN: 978-1-305-66704-4	\$33	\$38

North American Technician Excellence (NATE) Prep/Recertification

NATE's certification tests represent knowledge of HVAC and HVACR systems and candidates can earn installation and/or service certification in one or more specialty areas. As an independent, non-profit national organization supported by a broad-based coalition of industry leaders, NATE represents a shared commitment to improving the HVACR industry through voluntary testing and certification. NATE supporters include contractors, distributors, education and training providers, manufacturers, technicians, utilities, and their respective trade associations.

RSES and many of its Chapters are official testing and training organizations of NATE, offering both specific training programs and NATE's complete family of tests for service technicians and installers, and the specialties under the HVACR umbrella. In recent years, NATE has developed its own test-prep materials, however, the fundamentals of HVACR covered within the RSES NATE Prep series still offers a broad range of knowledge not only to assist with taking the exams, but for in-depth on-the-job knowledge that is crucial to succeeding in each area of the industry. Qualified testing organizations, including RSES, administer NATE training and testing opportunities at various locations throughout the year.



Preparing for the NATE Exam Series

Preparing for the NATE Exam is a series of training manuals designed to give HVACR technicians and installers the tools they need to be successful in mastering the key concepts required to pass the NATE examinations. Each manual in the series is written in clear and concise language and is illustrated with full color graphics that clarify important details.

Preparing for the NATE Exam: Core Essentials

The Core exam must be passed once before a specialty certification exam is taken.

CONTENTS:

- Soft Skills
- Trade Tools
- Safety
- Heat and Matter
- Electrical Fundamentals
- Transformers and Motors
- Electrical Diagrams
- Test Instruments
- Appendix A – Glossary of Terms
- Appendix B – Equations, Equivalents, Conversions
- Appendix C – Symbols
- Appendix D – Refrigerant Pressure-Temperature Tables
- Appendix E – Trade Math
- Appendix F – Answers to Review Questions

Este manual también está disponible en Español: Preparación para el Examen NATE: Fundamentos básicos.

The instructor CD is intended for HVACR instructors and trainers utilizing Microsoft PowerPoint software. It offers a review presentation for educators conducting anywhere from a two- to an eight-hour review session. The CD contains a complete PowerPoint overview of all materials covered in the Preparing for the NATE Exam: Core Essentials study book and includes some 570 slides and answers to all review questions. Topics covered include soft skills; trade tools; safety; heat and matter; electrical fundamentals; transformers and motors; electrical diagrams; test instruments; and more.

Item No.	Member Rate	Non-member Rate
360-600x Hard Copy ISBN: 978-1-61607-116-5	\$48	\$63
360-600e Digital Version ISBN: 978-1-61607-116-5	\$40	\$55
360-605x Spanish Hard Copy ISBN: 978-1-61607-197-4	\$48	\$63
360-605e Spanish Digital Version ISBN: 978-1-61607-198-1	\$40	\$55
360-313x Instructor CD	\$38	\$48



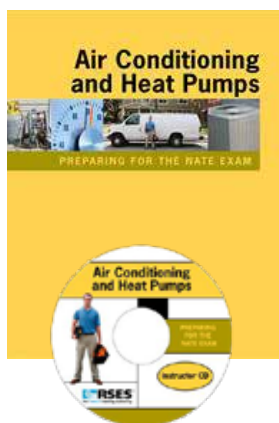
Preparing for the NATE Exam Core Essentials eLearning Course

4 CEHs, 0.4 CEUs

This eLearning training course consists of videos that parallel the chapters in the Preparing for the NATE Exam: Core Essentials book and includes end-of-chapter quizzes and a practice exam covering all the chapters to complete before taking your exam with NATE.

A certificate of completion for 4 CEHs/0.4 CEUs is available after the successful completion of the course and final exam.

Item No.	Member Rate	Non-member Rate
360-680 Full Course	\$105	\$135
Group Rates Available	Call Headquarters for Rates	



Preparing for the NATE Exam: Air Conditioning & Heat Pumps

The Air Conditioning and Heat Pumps manual is intended to help prepare HVACR professionals for both real-world exposure to these systems as well as this NATE specialty exam.

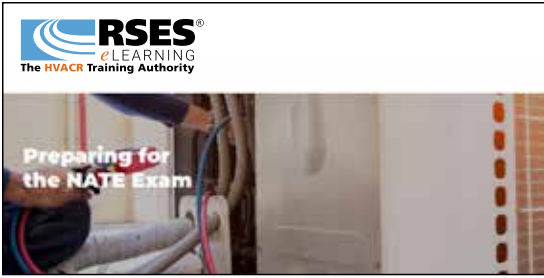
CONTENTS:

- Human Comfort and System Selection
- Heat Transfer and the Basic Refrigeration Cycle
- System Components
- Electrical Components
- Installation Guidelines
- Reading Electrical Schematics
- Troubleshooting Electrical Circuits
- System Performance Checks
- Appendix – Answers to Review Questions

Este manual también está disponible en Español: Preparación para el Examen NATE: Aire acondicionado y bombas de calor

The Instructor CD which features nearly 600 slides, as well as answers to all review questions, is an excellent tool for instructors that have extensive knowledge in the field and who seek an outline as part of a program of NATE exam review. Topics covered on CD include human comfort and understanding system selection; heat transfer and the basic refrigeration cycle; system components; electrical components; installation guidelines; reading electrical schematics, and understanding how they apply to system design and installation; troubleshooting electrical circuits; system performance checks; and more.

Item No.	Member Rate	Non-member Rate
360-601x Hard Copy ISBN: 978-1-61607-117-2	\$48	\$63
360-601e Digital Version ISBN: 978-1-61607-128-8	\$40	\$55
360-606x Spanish Hard Copy ISBN: 978-1-61607-199-8	\$48	\$63
360-606e Spanish Digital Version ISBN: 978-1-61607-200-1	\$40	\$55
360-321x Instructor CD	\$38	\$48



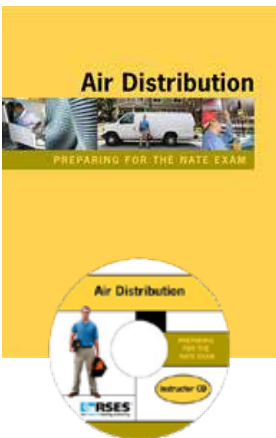
Preparing for the NATE Exam Air Conditioning and Heat Pump eLearning Course

4 CEHs, 0.4 CEUs

This online training course consists of videos that parallel the chapters in the Preparing for the NATE Exam: Air Conditioning and Heat Pump book and includes end-of-chapter quizzes and a practice exam covering all the chapters to complete before taking your exam with NATE.

A certificate of completion for 4 CEHs/0.4 CEUs is available after the successful completion of the course and final exam.

Item No.	Member Rate	Non-member Rate
360-681 Full Course	\$105	\$135
Group Rates Available	Call Headquarters for Rates	



Preparing for the NATE Exam: Air Distribution

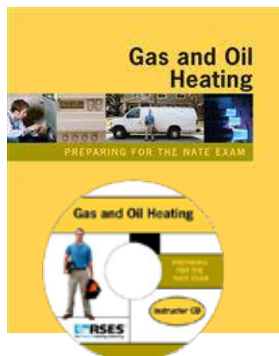
The Air Distribution manual is intended to help prepare HVACR professionals for both real-world exposure to these systems as well as this NATE specialty exam.

CONTENTS:

- Gas Furnaces
- Oil Furnaces
- Air Conditioning & Heat Pumps
- Controls
- Duct Systems
- Duct Fabrication & Installation
- Air Flow Measurement
- Design Considerations & System Analysis
- Appendix-Answer to Review Questions

The Instructor CD features more than 450 slides, as well as answers to all review questions and is an excellent tool for instructors that have extensive knowledge in the field and who seek an outline as part of a program of NATE exam review. Topics covered on the CD include gas and oil furnaces; air conditioning and heat pumps; controls and control systems; duct systems; duct fabrication, including duct-fabrication equipment, fabrication techniques for metal duct and ductboard, metal-duct installation, and flexible duct; air flow measurement; design considerations; system analysis; and more

Item No.	Member Rate	Non-member Rate
360-602x Hard Copy ISBN: 978-1-61607-137-0	\$48	\$63
360-602e Digital Version ISBN: 978-1-61607-138-7	\$40	\$55
360-120x Instructor CD	\$38	\$48



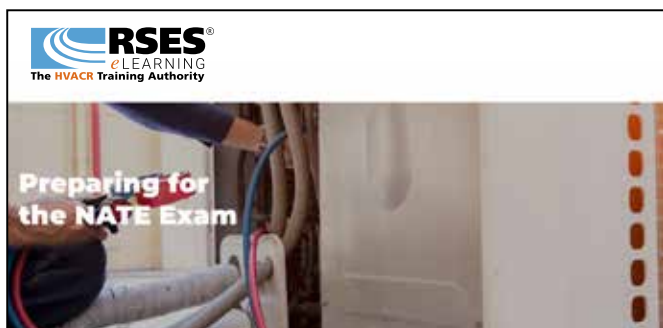
Preparing for the NATE Exam: Gas and Oil Heating

The Gas and Oil Heating manual is intended to help prepare HVACR professionals for both real-world exposure to these systems as well as this NATE specialty exam. Most of today's residential and light commercial fossil fuel heating systems use either gas or oil as the fuel source. Much of the information in this book is relative to both types of systems. There are some differences between gas and oil, of course, and those differences are noted so that the technician who wishes to become NATE-certified can prepare for either the Gas Heating exam or the Oil Heating exam. The final three Chapters in this book are devoted to oil systems.

CONTENTS:

- Introduction to Gas and Oil Heating
- Combustion
- Furnace Installation
- Venting
- Air Flow
- Troubleshooting
- Oil Burners
- Oil Tanks
- Preventive Maintenance

Item No.	Member Rate	Non-member Rate
360-603x Hard Copy ISBN: 978-1-61607-164-6	\$48	\$63
360-603e Digital Version ISBN: 978-1-61607-165-3	\$40	\$55
360-123x Instructor CD	\$38	\$48



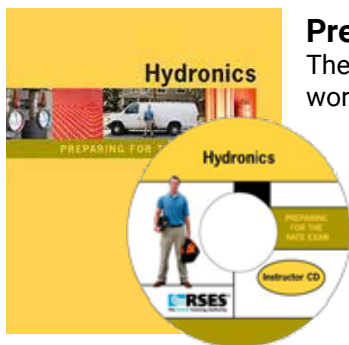
Preparing for the NATE Exam Gas Heating eLearning Course

4 CEHs, 0.4 CEUs

This online training course consists of videos that parallel the chapters in the Preparing for the NATE Exam: Gas Heating book and includes end-of-chapter quizzes and a practice exam covering all the chapters to complete before taking your exam with NATE.

A certificate of completion for 4 CEHs/0.4 CEUs is available after the successful completion of the course and final exam.

Item No.	Member Rate	Non-member Rate
360-682 Full Course	\$105	\$135
Group Rates Available	Call Headquarters for Rates	



Preparing for the NATE Exam: Hydronics

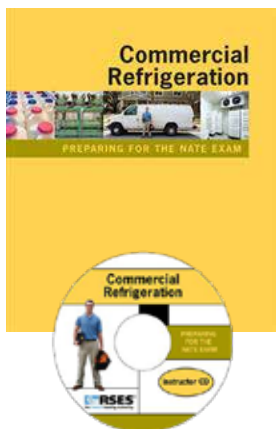
The Hydronics manual is intended to help prepare HVACR professionals for both real-world exposure to these systems as well as this NATE specialty exam. Hydronic heating systems are becoming more and more popular in both residential and light commercial applications. Due to their high efficiency, quieter operation and design flexibility, demand for these systems is on the rise. There are some differences between gas and oil as the fuel source, and those differences are noted so that the technician who wishes to become NATE-certified can prepare for either the Hydronics-Gas exam or the Hydronics-Oil exam.

CONTENTS:

- Introduction to Hydronic Heating
- Boilers
- Near-Boiler Piping System Components
- Piping Systems
- Controls
- Pumps
- Installation & Maintenance
- Fossil Fuel-Fired Hydronic Systems

The Instructor CD features more than 400 slides, as well as answers to all review questions, is an excellent tool for instructors who have extensive knowledge in the field and who seek an outline as part of a program of NATE exam review. Topics covered on the CD include: an introduction to hydronic heating; boilers; near-boiler piping system components; piping systems; controls; pumps; installation and maintenance; fossil fuel-fired hydronic systems; and more.

Item No.	Member Rate	Non-member Rate
360-604x Hard Copy ISBN: 978-1-61607-182-0	\$48	\$63
360-604e Digital Version ISBN: 978-1-61607-183-7	\$40	\$55
360-124x Instructor CD	\$38	\$48



Preparing for the NATE Exam: Commercial Refrigeration

The Commercial Refrigeration manual is intended to help prepare HVACR professionals for both real-world exposure to these systems as well as this NATE specialty exam.

CONTENTS:

- Electrical Fundamentals
- Refrigeration Fundamentals
- Refrigeration Equipment
- Refrigeration Components
- Regulations, Code, and Design
- Installation
- Service and Maintenance
- Large Commercial Refrigeration Systems
- Answers to Review Questions

The Instructor CD features more than 1,500 slides, as well as answers to all review questions, is an excellent tool for instructors who have extensive knowledge in the field and who seek an outline as part of a program for preparing students to take the NATE Commercial Refrigeration Exam. Topics covered on the CD include: electrical fundamentals; refrigeration fundamentals; refrigeration equipment; refrigeration components; electrical components; regulations, code, and design; installation; service and maintenance; large commercial refrigeration systems; and more.

Item No.	Member Rate	Non-member Rate
360-607x Hard Copy ISBN: 978-1-61607-202-5	\$48	\$63
360-607e Digital Version ISBN: 978-1-61607-203-2	\$40	\$55
360-125x Instructor CD	\$38	\$48

NATE Recertification via RSES

In addition to preparing professionals for taking NATE exams, RSES has several courses that have been approved by NATE for continuing education hours. The following list/credits is a recap, but not an exhaustive list. Chapter and Regional educational sessions also receive NATE approval for CEHs. Contact a local Chapter to find out if training is being held.

Refrigeration & Air Conditioning (R/AC)

- Principles of Refrigeration = 32 CEHs
- Compressors, Condensers and Cooling Towers = 36 CEHs
- Evaporators and System Components = 38 CEHs
- Tools, Controls and Troubleshooting = 42 CEHs
- Air Conditioning Principles = 37 CEHs
- Heat Transfer and Distribution = 32 CEHs

Heating

- Heating Fundamentals = 36 CEHs
- Electric Heating = 36 CEHs
- Gas Heating = 32 CEHs
- Oil Heating = 36 CEHs
- Hot Water Heating = 38 CEHs
- Steam Heating = 38 CEHs

Electricity

- Introduction to Electricity = 25 CEHs
- Electrical Components = 32 CEHs
- Basic Electronics = 40 CEHs
- Troubleshooting Components = 44 CEHs
- Troubleshooting Residential Equipment = 48 CEHs
- Electricity for the HVACR Technician = 42 CEHs

Controls

- Fundamentals of Controls = 30 CEHs
- Electromechanical Controls = 40 CEHs
- Pneumatic Controls = 40 CEHs
- Electronic Proportional Controls = 40 CEHs

Heat Pump Training Course = 128 CEHs

RSES Technical Institute

- Training Manual 1 = 72 CEHs
- Training Manual 2 = 72 CEHs
- Training Manual 3 = 72 CEHs

RSES Online Training Courses at The HVACR Learning Network powered by ESCO + RSES

- Air Conditioning Fundamentals = 20 CEHs
- Electricity for HVACR Technicians = 36 CEHs
- Safety for HVACR Technicians = 16 CEHs
- Hydrocarbon Refrigerants Course and Test = 8 CEHs
- NATE Core Essentials Online Training = 4 CEHs
- NATE Air Conditioning and Heat Pumps Online Training = 4 CEHs
- NATE Gas Heating Online Training = 4 CEHs

RSES Journal CEH Corner:

Simply visit the HVACR Learning Network, pay a nominal fee, read a specified published article from *RSES Journal*, successfully answer all 10 quiz questions correctly and print a certificate of completion for 1 CEH.

RSES Webinars:

The RSES Webinar Series is another way to earn CEHs. Past webinars are available through the HVACR Learning Network. Pay a nominal fee, watch a one-hour webinar, take/pass a 10 question quiz and earn 1 CEH.

Pennsylvania College of Technology (PCT)

RSES has an articulation agreement with the Pennsylvania College of Technology, based in Williamsport, Pa., that could provide college credit for students who have completed RSES training courses. Under the agreement, PCT will grant up to 51 credits for successful completion of specified RSES training courses toward a Bachelor of Science major in Heating, Ventilation & Air Conditioning Technology from its School of Construction & Design Technologies. Restrictions apply and complete details related to this program are available at www.rses.org. Following is an overview of RSES course hours to PCT college credits:

RSES Coursework	Hours	Penn College Coursework	Credits
Heat Pump Training Course	128	ACR 111: Introduction to Refrigeration	5
Heating Fundamentals	36	PLH 113: Mechanical Systems Design & Operation	4
Electric Heating	36	ELT 250: HVAC/R Electricity	5
Gas Heating	32	ACR 236: Air Conditioning Systems I	3
Oil Heating	36	ACR 239: Residential HVAC System Design	3
Hot Water Heating	38	ELT 252: HVAC Controls I - Residential	4
Steam Heating	38	PLH 236: Basic Heating Systems (Installation)	3
Principles of Refrigeration	32	ACR103: HVAC Print Reading & Automated Design	2
Compressors Condensers and Cooling Towers	36	ACR 249: Advanced HVAC System Service	3
Evaporators and System Components	38	ACR 251: Warm-Air Heating & Duct Design	3
Tools Controls and Troubleshooting	42	ELT 253: HVAC Controls II - Commercial	4
Air Conditioning Principals	37	PLH 244: Hydronic Heating Systems	4
Heat Transfer and Distribution	32	ACR 221: Refrigeration Applications - Commercial Installation/Service	4
Introduction to Electricity	25	ACR 220: Refrigeration Applications - Commercial Systems/Design	4
Electrical Components	32		
Basic Electronics	40		
Troubleshooting Components	44		
Troubleshooting Residential Equipment	48		
Fundamentals of Controls	30		
Pneumatic Controls	40		

RSES Coursework	Hours	Penn College Coursework	Credits
Electromechanical Controls	40		
Basic Electronics for Controls	40		
Electronic Proportional Controls	40		
Total RSES Hours	940	Total PCT Credits	51