As an employer...the CM and CMS designations mean that you’re getting an employee with superior knowledge.

Originated in 1935, the CM designation indicates that an individual has passed a very difficult examination, testing 18 categories of knowledge required in the installation and servicing of refrigeration and air conditioning equipment. Although the examinations require a thorough understanding of the fundamentals of mechanical refrigeration theory, they are written to test the professional’s working knowledge of installation, service, and troubleshooting procedures. The CMS designation indicates that an individual has passed one or more of the eight Specialist exams available. Astute contractors, managers, and business owners across the continent recognize the level of competence that CM and CMS designations indicate.

“Kerr Controls feels that it’s very important for our employees to stay current with industry developments. We believe RSES programs provide excellent avenues to accomplish that goal—to the extent that the company not only pays the employees’ annual membership dues, but covers costs for them to attend conferences where CM testing is held. If an employee passes the CM test, we have a $500 bonus for them!”

—Kevin Toomey
Sales Manager
Kerr Controls Limited
Truro, Nova Scotia, Canada

As an employer...in a word, the CM and CMS classifications mean prestige.

RSES Certificate Members and Certificate Member Specialists are among the top service professionals in the entire industry. Only 15% of current RSES members hold the prestigious CM designation, and only 2.5% have achieved CMS status! Current pass rates average 30% for CM, and 20% for CMS.

“People who take the time to study and pass the RSES CM exam really stand out among their peers. Our Engineering Department believes strongly in the value of certification, particularly CM, because it demonstrates a competency level otherwise difficult to gauge. We believe that if you’re furthering your education, you’re adding to your overall career portfolio, and that can only enhance your employment potential.”

—Roger Ufford, CMS
HVACR Supervisor, Engineering Memorial Hospital Chattanooga, TN

Achieving CM and CMS status can have a significant effect on your career. From direct financial incentives to long-term job security, attaining CM and CMS provides your employer with the criteria by which to evaluate and reward your personal commitment to continuing education.

“We award a $500 immediate bonus to employees who pass the CM test. We know that CMs know what they’re doing—in fact, if a CM applies for a posted job opening, they’re usually hired on the spot! We also feature information about CMs in sales literature for our customers, so that they understand why our technicians are superior to most of the rest of them out there!”

—Pat Davis, CM
Brothers Air Conditioning
Carrollton, TX

WHAT DO CM AND CMS MEAN TO YOU?

FREQUENTLY ASKED QUESTIONS ABOUT CM AND CMS CLASSIFICATIONS

Q What are CM and CMS?
A Certificate Membership (CM) and Certificate Member Specialist (CMS) are classifications of RSES membership. Exclusive to RSES members, these designations are earned after successfully passing rigorous written examinations.

The CM exam tests 18 categories of knowledge required in the installation and servicing of refrigeration and air conditioning equipment. It requires a thorough understanding of the fundamentals of mechanical refrigeration theory, as well as working knowledge of installation, service, and troubleshooting procedures. There are 150 multiple-choice questions on the exam. A grade of 70% is required to pass.

There are currently eight CMS exams, each focusing on a specialized area of expertise: Commercial Air Conditioning, Commercial Refrigeration, Controls, Heating, Domestic Service, HVACR Electrical, Heat Pump, and Dynamic Compression. There are 100 multiple-choice questions on each Specialist exam. A grade of 80% is required to pass.

Q Who can take the CM Exam?
A The CM exam may be taken by any RSES member in good standing who is an Active member. RSES Canada requires two years of Active membership for their members before taking the exam.

Q Who can take a CMS exam?
A CMS exams may be taken by any RSES member in good standing who has held Certificate Member status for 90 days or longer. It is not possible to take both the CM and a CMS exam at the same time.

Q What does it cost to take a CM or CMS exam?
A Every RSES member gets to take one CM exam free of charge. After that, it costs only $25 to sit for additional CM exams. All CMS exams cost $25 per test.

Q What does RSES do to promote my achievements?
A All successful CM and CMS candidates receive personalized wall certificates suitable for framing. In addition, all future correspondence includes the CM or CMS designation with the member’s name—and the member is encouraged to do the same. With the member’s permission, his or her employer is automatically notified of successful passing. Further, the names of successful candidates are included in each month’s RSES Journal, as well as listed in press releases and broadcast e-mails sent to industry peers and publications.

Each year, the member with the highest score (Society-wide) on the CM exam receives the John Spence Award at the Annual Conference. In each Specialist category, the Imperial Award is granted to the member with the highest score. Members who achieve five or more of the currently available Specialist categories earn the Wayburn Wilson Award. In addition, CM members can purchase the exclusive RSES CM ring, and CMS members can add diamonds to it for each CMS Specialty exam passed. Handsome walnut plaques are available for purchase in all CMS categories.

Q Where can I find out more about CM and/or CMS?
A Refer to the inside front cover and page 8 of this catalog for more information!

© Copyright 2008 by the Refrigeration Service Engineers Society.
RSES: THE HVACR TRAINING AUTHORITY

Dear HVACR Professional:

The Refrigeration Service Engineers Society (RSES) was founded in 1933 as a non-profit educational society. From the beginning, the Society’s mission has been to advance the heating, ventilation, air conditioning, and refrigeration (HVACR) industry by furthering the education and skills of the practicing service professional.

With more than 18,000 members and tens of thousands of additional technicians who routinely use our training materials, RSES is the organization for professional HVACR technicians and contractors. That’s why RSES is known as “The HVACR Training Authority.”

As the HVACR Training Authority, RSES offers industry-leading educational and certification programs to service professionals of all experience levels engaged in the HVACR industry. We invite you to look through our catalog and consider taking advantage of the many educational opportunities provided by RSES.

Sincerely,

The RSES International Board of Directors

---

**TABLE OF CONTENTS**

- Membership ...................... 2
- Service Application Manual (SAM) ..................... 6
- Certification ....................... 7
- Seminars ......................... 9
- *RSES Journal* ..................... 10
- RSES.org ......................... 11
- Training Courses .................. 12
- CD/DVD Training and Reference ......................... 26
- Certification Preparation and Reference Materials ........ 35
- Merchandise ........................ 39
- Chapter Supplies .................. 46
- Special Forms ...................... 49
- New Products ...................... 55

---

**TWO EASY WAYS TO ORDER!**

1. **Phone:** Call our toll-free number at 800-297-5660. International residents call 847-297-6464.

2. **Internet:** Order online at www.rses.org by selecting “Online Store.”
ABOUT RSES

Because of our name, you may think that RSES (Refrigeration Service Engineers Society) concentrates solely on refrigeration. Don’t be fooled—RSES is more than refrigeration! RSES is also involved in 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 and technicians, from students through Certificate Member Specialist (CMS) members.
☐ RSES International Seminars are not-to-be-missed opportunities for intensive learning and are held year-round in various cities across North America.
☐ The RSES Annual International Conference allows you to join your HVACR peers for an educational technology exposition, condensed educational sessions, and Society business meetings.

Founded in 1933, RSES is a non-profit organization of more than 18,000 members in the United States and Canada, as well as affiliate organizations worldwide.

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

RSES 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.

MEMBERSHIP

2

REASONS TO JOIN RSES

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

• Training to reduce callbacks
• Training to improve diagnostic and troubleshooting skills
• Tips for working and communicating with customers and the general public
• Action plans to improve efficiency
• Safety guidelines
• Basic through advanced levels of training

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 monthly magazine of RSES, is the industry’s leading source for technical information that HVACR contractors and service technicians 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 Access
Your local Chapter is an educational resource offering training in either classroom or self-study settings.

Direct Access
The value of your membership extends to the growing presence of RSES on the Internet. As an RSES member, you’ll have exclusive online access to many important features not available to nonmembers.
INDIVIDUAL MEMBERSHIP

At RSES, we know how challenging it is to keep up with all of the advances in the HVACR industry. As you seek to advance your career, you need somewhere to turn for timely information, training, and relevant education. Look no further than RSES, a membership organization with more than 70 years of experience providing comprehensive training, education, and certification programs to the entire HVACR industry. If you’re an HVACR employee seeking new skills, career advancement, and recognition, become an RSES member. As an RSES member, you’ll have access to superior educational resources to help you achieve your career goals.

It’s no surprise that the #1 reason people join RSES is for our specialized HVAC training and education. From self-study manuals and CDs to classroom-based Chapter meetings to intensive 1- or 2-day technical seminars, RSES has all the preparatory materials necessary to advance an individual’s career.

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—Certificate members who have passed one or more of the Specialist exams

Joining via a local RSES Chapter
When you join through a local RSES Chapter, the Chapter secretary receives your completed application and membership fees (specific membership fees vary by Chapter) and forwards them to RSES International Headquarters for processing.

Joining via RSES International Headquarters
Should you be unable to get in touch with the Chapter contact person, you may send your completed application along with a check for $128.00, payable to RSES, to RSES International Headquarters. When you join directly through RSES Headquarters, we will request affirmation of your application from the Chapter nearest your home. Shortly thereafter, you will be eligible for all Society benefits, including receiving the official monthly magazine, RSES Journal.

Contact RSES at:
RSES International Headquarters
1911 Rohlwing Road, Suite A
Rolling Meadows, IL 60008-1397
Phone: 800-297-5660 or 847-297-6464
Fax: 847-297-5038
Web site: www.rses.org

Joining online at www.rses.org
The most immediate way to join RSES is through the RSES Web site. Come visit us at www.rses.org. Once there, select “Join RSES” and complete the enrollment form to begin enjoying membership benefits, including deep discounts on training and educational materials.

NOTE A membership application form can be found in the “Special Forms” section (see page 49).

STUDENT MEMBERSHIP

Student membership provides students with an introduction to the Society while allowing them to enjoy the benefits of full membership. The only benefit that students must await is the ability to take the Certificate Member or Certificate Member Specialist exams.

Student members are individuals enrolled in HVACR technology programs within regionally accredited vocational training institutions.

Student membership dues are one-half the International direct dues amount. In addition, all new student members will receive their choice of a free cap or t-shirt broadcasting their new status.

Student members may retain the student member classification for a period of four years. Unless the local Chapter provides notification otherwise, International Headquarters will change a student member’s classification to active member at the end of the first four years.

H O W  T O  J O I N

Request, complete, and return a membership application along with the appropriate annual membership fees to either a local RSES Chapter or RSES International Headquarters. Individual membership is nonrefundable and nontransferable.

Joining via a local RSES Chapter
When you join through a local RSES Chapter, the Chapter secretary receives your completed application and membership fees and forwards them to RSES International Headquarters for processing.

Joining via RSES International Headquarters
Should you be unable to get in touch with the Chapter contact person, you may send your completed application along with your current course schedule and a check for $51.50, payable to RSES, to RSES International Headquarters. When you join directly through RSES Headquarters, we will request affirmation
MEMBERSHIP

of your application from the Chapter nearest your home. Shortly thereafter, you will be eligible for all Society benefits (excluding the ability to take Certificate Member and Certificate Member Specialist exams), including receiving the official monthly magazine, **RSES Journal**.

Contact RSES at:
RSES International Headquarters
1911 Rohlwing Road, Suite A
Rolling Meadows, IL 60008-1397
Phone: 800-297-5660 or 847-297-6464
Fax: 847-297-5038
Web site: www.rses.org

NOTE
A student membership application form can be found in the “Special Forms” section (see page 50).

MEMBERSHIP BENEFITS

**RSES membership benefits include:**
- Special discounts on training and educational opportunities.
- A subscription to **RSES Journal**, the HVACR industry’s premiere monthly magazine.
- Access to the entire contents of the Service Application Manual (SAM) online, plus free periodic SAM updates throughout the year via hard copy. See the SAM table of contents on page 6.
- 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. Upon joining RSES, student members are inducted at the Student (Student Technician) level, and individual members are inducted as Level 1 Technicians. Individual members have the opportunity to advance from one level to the next through course participation or by passing required exams.
- Certificate Member and Certificate Member Specialist are classifications of RSES membership exclusive to RSES members (with the exception of student members). This status signifies to customers, employers, and the entire HVACR industry your knowledge and commitment to excellence and improvement.
- RSES Career Center unites employers with technicians. RSES individual and corporate members enjoy discounts on job-posting fees. In addition, RSES members have exclusive access to new job opening for seven days before the job is posted to the general public.
- Entry into the members-only section of the RSES Web site, allowing exclusive access to the RSES Partners in Education section that highlights technical data from a number of original equipment manufacturers.
- Entry into the members-only section of the RSES Web site, allowing exclusive access to the **RSES Journal** Archives section that contains features and technical articles dating back to December 1995. Topics include tips on servicing, maintaining, and troubleshooting commercial and residential HVAC equipment.
- The MSAC Hotline is a feature exclusive to **RSES Journal**. The MSAC (Manufacturers Service Advisory Council) comprises longtime industry experts who answer technical questions submitted by readers. Members enjoy free access to this benefit in the magazine and online.
- Chapter training programs based on training courses that are available at discounted prices to members.
- Continuing education units (CEUs) for specific training programs.
- Networking opportunities through Chapter, state, and regional conferences.
- Use of the RSES logo on all correspondence and on Chapter Web sites.
- Member rates for National Air Filtration Association (NAFA) certification programs, publications, and conferences.
- Various insurance programs are available to RSES members through Selman & Company, including life insurance, health care insurance (specifically, short term medical, Medicare supplement, hospital indemnity plan, catastrophe major medical, life line screening, and major medical), accidental death and dismemberment insurance, pet insurance, disability income insurance, dental insurance, and cancer insurance.
- Through John Hancock, RSES members have access to 140 years of financial knowledge, including investment products, ideas, concepts, and protection solutions.
- Chase Paymentech Solutions LLC offers RSES members merchant services for credit card processing.
- GM extends a $500 private offer on the purchase or lease of most GM vehicles to members of RSES.
- Discounts on car rentals and hotel/motel rooms.
- The opportunity to apply for a no-fee RSES-branded credit card. A portion of each purchase helps fund RSES programs and services. Additionally, a line of credit (Gold Option) and revolving loan (Gold Reserve) are available.
- Participating Jiffy Lube Inc. locations extend a 10% discount to RSES members.
- Professional Web site and Web marketing services at reduced rates through Market Hardware.
- Safe and secure electronic check payment services through Telecheck Solutions.
- Low rates on personal or business travel through YTB Travel & Cruises.
- Discounts on copies and select services through FedEx Kinko’s.

CORPORATE MEMBERSHIP

Why become an RSES Educational Foundation corporate member? Because doing so enhances the extent of your company’s commitment to the service quality standards that the HVACR community upholds. Through corporate membership, you are able to provide up-to-date training programs to your HVACR technicians—demonstrating
your goal to maintain service excellence and pride in your workforce.

As a corporate member, you control your technicians’ training programs and retain corporate membership privileges even if a technician leaves the company. In other words, the benefits follow the business, not the individual technician. This gives you the flexibility to offer ongoing training as employees grow into their careers. This is a valuable perk in light of employee retention concerns, especially because it’s more cost-effective to retain employees than to train new ones.

Corporate Membership Benefits
Corporate members qualify for special discounts on all of RSES training and educational materials, international seminars and the RSES Annual Conference. They also receive:

- Subscriptions to RSES Journal (based on the corporate member category).
- Discounted advertising rates in RSES Journal.
- Ability to appoint proctors for RSES certification exams.
- Discounts for corporate exhibit booths at the RSES Annual Conference.
- A link to your company’s Web site on www.rses.org.
- Access to members-only online resources.
- Chase Paymentech Solutions LLC offers RSES members merchant services for credit card processing.
- RSES Career Center unites employers with technicians. RSES individual and corporate members enjoy discounts on job-posting fees.
- Use of the RSES logo.
- Training material and merchandise orders may be invoiced instead of requiring prepayment.
- A walnut membership plaque for proudly displaying your membership status.
- Professional Web site and Web marketing services at reduced rates through Market Hardware.
- Safe and secure electronic check payment services through Telecheck Solutions.

- Low rates on personal or business travel through YTB Travel & Cruises.
- Discounts on copies and select services through FedEx Kinko’s.

**HOW TO JOIN**

Request, complete, and return a corporate membership application along with the appropriate membership fees to RSES Educational Foundation.

**Joining via RSES International**
You may send your completed application along with the appropriate membership dues to:

RSES Educational Foundation
1911 Rohlwing Road, Suite A
Rolling Meadows, IL 60008-1397
Phone: 800-297-5660 or 847-297-6464
Fax: 847-297-5038
Web site: www.rses.org

**Joining online at www.rses.org**
The most immediate way to join RSES is through the RSES Web Site. Come visit us at www.rses.org. Once there, select “Join RSES” and complete the enrollment form to begin enjoying membership benefits, including deep discounts on training and educational materials.

**NOTE**

A corporate membership application form can be found in the “Special Forms” section (see page 51).

---

**Corporate Membership**

<table>
<thead>
<tr>
<th>Category</th>
<th>Annual Dues</th>
</tr>
</thead>
<tbody>
<tr>
<td>Manufacturer/Producer</td>
<td>$300.00</td>
</tr>
<tr>
<td>Small (fewer than 100 employees)</td>
<td>$300.00</td>
</tr>
<tr>
<td>Medium (101–500 employees)</td>
<td>$500.00</td>
</tr>
<tr>
<td>Large (more than 500 employees)</td>
<td>$1,000.00</td>
</tr>
<tr>
<td>Power Utility</td>
<td>$250.00</td>
</tr>
<tr>
<td>Wholesaler/Distributor</td>
<td>$200.00</td>
</tr>
<tr>
<td>Manufacturer’s Representative</td>
<td>$150.00</td>
</tr>
<tr>
<td>Contractor</td>
<td></td>
</tr>
<tr>
<td>1–3 HVACR employees*</td>
<td>$150.00</td>
</tr>
<tr>
<td>4–10 HVACR employees*</td>
<td>$200.00</td>
</tr>
<tr>
<td>11–19 HVACR employees*</td>
<td>$300.00</td>
</tr>
<tr>
<td>20+ HVACR employees*</td>
<td>$400.00</td>
</tr>
<tr>
<td>Training Associate (School, Learning Center, Correctional Facility, etc.)</td>
<td>$200.00</td>
</tr>
<tr>
<td>Industry Association</td>
<td>$200.00</td>
</tr>
</tbody>
</table>

*Includes service/installation technicians, first-line supervisors, estimators, schedulers, sheet metal specialists, etc.
SAM (Service Application Manual) is the resource you need to acquire the broad-based competence needed for success in the HVACR industry. The original HVACR resource, SAM contains literally thousands of pages of technical data, equipment analyses and evaluations, field application instruction, regulations, good practice codes, business development guidance, and more. The entire contents of SAM are available online at the RSES Web site. New chapters, covering topics of immediate importance to the HVACR industry, are regularly added. As new chapters become available, they are posted online and print copies are sent free of charge to RSES members.

Contents are grouped into the following subject matter categories:
- Index and User Information
- Mathematics and Conversion Tables
- Principles of Refrigeration
- Refrigerants
- Lubrication
- Contaminants in Refrigerating Systems
- Moisture in Air
- Foods and Their Preservation
- Electric Currents and Circuits
- Insulation
- Refrigeration Charts and Their Use
- Compressors
- Condensers
- Closed-Circuit Condensers
- Cooling Towers and Evaporative Condensers
- Electric Motors
- Evaporators
- Refrigerant Flow Controls
- Motor-Starting Equipment
- Electrical Controls
- Pneumatic Controls
- Defrosting
- Electronic Controls
- Refrigerant Cylinders
- Reverse Cycle Refrigeration
- Two and Three Stages
- Absorption Refrigeration
- Ammonia Refrigeration
- Cabinet Construction and Repairs
- Store and Market Fixtures
- Soda Fountain and Ice Cream Cabinets
- Ice-Making Machines
- Beverage Cooling
- Liquid Chilling
- Household Refrigerators
- Estimating the Heat Load
- Selecting Refrigeration Equipment
- Air Conditioning—General
- Room and Store Coolers
- Psychrometric Chart
- Evaporative Cooling
- Ducts and Grilles
- Centrifugal Blowers and Fans
- Air Filters
- Air Treatment
- Selecting Air Conditioning Equipment
- Residential Heating and Cooling Systems
- Commercial and Industrial Heating and Cooling Systems
- Piping
- Tubing and Fittings
- Boilers
- Water Treatment
- Solvents and Water Treatment
- Soldering, Brazing, and Welding
- Service
- Specialized Heating and Cooling Equipment
- Vacuum Pumps
- Tools and Indicating and Recording Instruments
- Energy Conservation
- Standards
- Safety and First Aid
- Business Administration
- Miscellaneous Tables
- Wiring Diagrams

Note: Contents are subject to change as updates and new chapters become available.
Invest in yourself and your future through certification! Being certified signifies that you have the technical skills and knowledge and have met the necessary requirements to install and service today’s complex HVAC systems effectively. Whether you need EPA Section 608, NATE, or R-410A certification, or are seeking RSES CM or CMS status, being certified proves your competency to your employers and your customers. Certification highlights your area of expertise and shows that you have the training needed to provide quality, professional service.

Through certification you will become a more valuable asset to your employer and your customer. Although most certification is voluntary, it will give you a competitive edge. By obtaining certification and achieving a higher standard of job performance, you will position yourself to move ahead in the industry.

If you need a structured exam preparation program to help you master the skills and material that most often appear on HVAC industry certification exams, consider the *DeWalt HVAC Technician Certification Exam Guide* (see page 38).

U.S. ENVIRONMENTAL PROTECTION AGENCY (EPA) SECTION 608 CERTIFICATION

RSES has one of the largest Environmental Protection Agency programs in the industry. RSES materials have been used to certify nearly 200,000 technicians in accordance with Section 608 of the U.S. Clean Air Act.

Who needs to be certified?
Since November 14, 1994, the sale of all CFC and HCFC refrigerant has been restricted to technicians certified through an EPA-approved certifying organization.

Any person who performs maintenance, service, repair, or disposal that could reasonably be expected to release refrigerants into the atmosphere must be certified. *Note: Apprentices are exempt from certification requirements provided the apprentice is closely and continually supervised by a certified technician. The definition of “technician” specifically includes the following activities:*

- attaching and detaching hoses and gauges to and from the appliance to measure pressure within the appliance
- adding refrigerant to or removing refrigerant from the appliance
- any other activity that violates the integrity of MVAC-like appliances and small appliances.

What does the exam consist of?
The EPA Section 608 certification exam is made up of 100 multiple-choice questions. Each set of 25 questions is a “section” for a specific “Type” of certification, as follows:

- **Core** (Questions 1–25). A Technician must pass Core in order to earn any other certification.
- **Type I** (Questions 26–50). For servicing small appliances.
- **Type II** (Questions 51–75). For servicing or disposing of high-pressure appliances, except small appliances and MVACs.
- **Type III** (Questions 76–100). For servicing or disposing of low-pressure appliances.
- **Universal**. The successful passing of all four sections of the exam.

A passing score of 70% or better is required in each section to pass. The exam is a closed-book test.

What should I study to prepare for this exam?
RSES has a softbound book entitled *Refrigerant Usage Certification: A Study Guide for Service Technicians* available for sale (see page 36). This study guide is presented in an easy-to-follow format and provides the necessary information for preparing for all “Types” of certification. In addition, RSES offers the Refrigerant Usage Certification Review CD for instructors (see page 30), and the HVAC Maestro Section 608 EPA Certification Review CD (see page 34), which is excellent for students and instructors alike.

Where can I take the exam?
EPA certification testing is conducted by an approved proctor through the local Chapters of RSES. Contact your local Chapter to obtain testing date and location information in your area. Find a local Chapter by visiting the RSES Web site.

For further information on Section 608 certification regulations, please visit www.epa.gov/ozone/title6/608/.

NORTH AMERICAN TECHNICIAN EXCELLENCE (NATE)

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.

Qualified testing organizations, including RSES, administer NATE training and testing opportunities at various locations throughout the year. NATE exams are also offered in conjunction with RSES.
International Seminars and at the RSES Annual Conference.

What material can be used to prepare for the NATE exam?
RSES offers the first and most extensive NATE certification preparatory manual. As part of an ongoing educational mission, the Air Conditioning Contractors of America (ACCA) and Plumbing-Heating-Cooling Contractors—National Association Educational Foundation (PHCC) have worked in conjunction with RSES to co-sponsor the Residential and Light Commercial HVACR Service Technician Reference Manual/Guide for NATE Certification (see page 35). In addition, NATE Service Review presentations are available on CD for instructors and technicians (see pages 29–30). RSES also markets core, gas furnace, air distribution, and heat pump and air conditioning test refresher DVDs/CDs (see pages 32–33).

RSES MEMBERSHIP CLASSIFICATIONS
Exclusive to RSES members, the CM and CMS designations are earned after passing rigorous exams.

Certificate Member (CM)
Individuals who have achieved Certificate Member (CM) status have attained a special category of RSES membership. 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.

View the breakdown of the 18 exam categories by visiting the Training section on the RSES Web site.

To document the difficulty of the CM 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!

What else do I need to know about the CM exam?
- The CM exam is available only to RSES members.
- Any active member may take the CM exam. The cost for the CM exam is $25.
- Technical Institute Manuals 1, 2, and 3 (see pages 23–25) provide a comprehensive course of study for those members who wish to obtain CM status.

R-410A SAFETY CERTIFICATION
As more manufacturers build air conditioning equipment using R-410A, it is important that contractors and technicians understand the safe handling, charging, operating characteristics, and proper applications of this refrigerant.

Passing the Universal R-410A Safety and Training exam will result in a certification issued by HVAC Excellence. Exams are the property of and will be processed by HVAC Excellence. Exams are being provided as a courtesy and convenience to the members of RSES.

What material can be used to prepare for the R-410A Safety and Training exam?
RSES suggests the Universal R-410A Safety & Training manual (see page 38) and/or the corresponding interactive CD-ROM (see page 30). In addition, RSES offers the Residential Split-System Cooling: Mechanical Refrigeration Troubleshooting R-22/R-410A CD (see page 26).

Certificate Member Specialist (CMS)
A Certificate Member Specialist (CMS) has passed a comprehensive and difficult exam in a specific area of expertise. Current pass rates for Specialist exams average approximately 20%. Only about 2.5% of the RSES membership holds this prestigious classification of membership. CMS exams are available only to RSES CM members. There are eight categories of testing from which to choose:

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

View the breakdown of exam categories for each exam by visiting the Training section on the RSES Web site.

The cost for CMS exams is $30 per exam.
RSES seminars provide great opportunities for obtaining continuing education and up-to-date industry information. Seminars are held year-round in various cities across North America.

RSES is proud to have quality educational professionals presenting the seminars. Seminar instructors are knowledgeable trainers who have many years of experience in the HVACR industry. Their expertise enhances a seminar participant’s learning experience. Most instructors use interactive methods and all are sensitive to the needs of seminar attendees.

To help raise the competency level of technicians, RSES has partnered with major manufacturers. Through these partnerships, RSES will offer shared educational seminars to RSES members and the HVACR industry.

Many RSES seminars have been recognized by North American Technician Excellence (NATE) for continuing education hours. Technicians who attend one or more of these seminars will receive credit toward renewing their NATE certification.

WHAT’S AVAILABLE?

A sampling of the many topics available includes:
- Electrical Troubleshooting
- Troubleshooting Air Conditioning
- Indoor Air Quality: Beyond the Basics
- Troubleshooting Supermarket Equipment
- Troubleshooting Steam and Hot Water Systems
- A Practical Approach to Airflow and Air Distribution
- Electrical Schematic Analysis: Basic to Advanced
- Carbon Monoxide Safety and Combustion Analysis and Performance
- HVAC Control Systems: From Basic Electronics to Open Protocol Networks
- Train the Trainer: HVACR Presentation and Training Techniques for Rookies and Veterans
- Working with R-410A
- Residential Air Conditioning Installations
- Residential Furnace Installations
- Residential and Light Commercial Air Conditioning Preventive Maintenance Inspections
- Residential and Light Commercial Gas Heating Preventive Maintenance Inspections
- Systematic Troubleshooting of Commercial Refrigeration Systems
- Systematic Troubleshooting of Residential Air Conditioning Systems
- Systematic Troubleshooting of Residential Gas Heating Systems
- Basic Refrigeration Piping Practices
- Heat Load Calculations and Equipment Sizing for Commercial Refrigeration Systems
- NATE Training

WHY HAVE A SEMINAR?

Education is priceless! Properly trained technicians who are up-to-date on the latest technology are able to perform their jobs in a professional manner with fewer callbacks—a win/win situation for the customer, the technician, and the HVACR business owner.

The classroom setting is still the best learning experience. Knowledgeable instructors, combined with a lively exchange of ideas from the participants, provide an atmosphere conducive to learning. Many seminar attendees have commented that even though they thought they knew the subject matter, a “light went on” after attending an RSES seminar, and they now better understand how to handle a particular problem.

As part of an ongoing commitment to advancing the professionalism and knowledge of service technicians in the HVACR industry, RSES actively supports industry certification. In pursuit of this goal, opportunities for EPA, CM, CMS, and NATE certification tests can be made available at each seminar.

BRING A SEMINAR TO YOUR AREA

RSES can help Chapters, associations, wholesalers, etc. host seminars. Contact RSES Headquarters for more information.
EDITORIAL OVERVIEW

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

President's Letter
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.

Viewpoint
Editor-in-Chief John Iwanski showcases his 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.

Industry News
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 upcoming industry-related and RSES events.

Business Sense
This column offers advice and methods on how to improve the management of HVACR businesses.

Service Sense
Useful, practical advice on how contractors and service technicians can improve their customer service skills.

MSAC Hotline
The Manufacturers Service Advisory Council (MSAC) comprises more than 25 longtime industry experts. These experts answer technical questions submitted by our readers in the MSAC Hotline.

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 Report/RSES News
These two departments keep readers informed about new programs and news emanating from RSES Headquarters, Chapters, and regions.

Chilling Out
This popular back-of-the-book department includes technical and safety tips for contractors, service technicians, and installers.

www.rsesjournal.com
Visit RSES Journal's Web site to access the latest President's Letter, Industry News, Features, MSAC Hotline, and Columns. (Some sections require membership to access.)

RSES Journal Mission Statement:
To provide authoritative, useful information to the RSES membership 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's mission of training and education for its members and the HVACR industry.

NOTE
You can purchase a subscription to RSES Journal even if you’re not a member of RSES. An RSES Journal subscription form can be found in the “Special Forms” section (see page 52).
The value of your membership in RSES extends to the organization’s growing home on the Internet. You can find the latest RSES news, learn more about RSES training opportunities, become a member, purchase RSES training material or merchandise, and much more on the RSES Web site.

FINDING YOUR WAY AROUND RSES.ORG

About RSES
Under this section you will find RSES vision and mission statements, a brief history of RSES, and the governance structure of RSES, including Board of Director contact information, Society bylaws, and International Headquarters contacts. In addition, you can obtain the latest RSES news and information about industry events, read RSES Educational Foundation information, request an RSES catalog, visit the RSES Career Center, and access a general FAQ section, helpful HVACR industry links, and the Terms and Conditions of www.rses.org.

Membership
Review the benefits of individual, student, and corporate membership, check out the classes/categories and/or the categories/annual dues of individual and corporate membership, locate a chapter, link to a select group of corporate members’ Web sites, browse the membership FAQs, print out a new member application, or join online.

Training
Find out more on available training materials and certification, examine RSES NATE-recognized training, explore the Service Application Manual (SAM) subject index, table of contents, and sample chapter, view proctor information, the Instructor Workshop, and training FAQs in this area.

Conference
Obtain the most current information available on the RSES Annual Conference in this section.

Online Store
This portion of the Web site provides individuals with the ability to buy RSES training material and merchandise online. The Online Store is convenient and secure. Go through the online store FAQs or find out specific ordering, shipping and handling, restocking fees, and return/refund policies.

RSES Journal
Learn more about the RSES Journal mission statement, demographics, features, RSES Journal FAQs, and subscription information in this portion of the Web site.

Join RSES
Become an individual or corporate member quickly, easily, and securely online.

Member Login
RSES members have access to specific areas of the RSES Web site that are not available to nonmembers. Once logged in, members can view Service Application Manual (SAM) chapters online or via PDF, visit their Chapter Central page to view Regional and Chapter contact information, communicate with Chapter officers, read Chapter meeting minutes, and access various other links. Also included in this area is the RSES Journal Online Archives, technical product data from Partners in Education original equipment manufacturers, and links for updating your e-mail address. In addition, individuals may download the RSES logo and view and/or print important RSES forms and manuals.
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, and the RSES Technical Institute Training Manuals.

This section contains a detailed description of all RSES training courses, and includes the table of contents for each manual.

Continuing education units (CEUs) are listed as a guideline to organizations interested in conducting classes in any of the listed courses. CEUs are issued only to those students who participate in an instructor-led course.

Training courses that have been recognized by North American Technician Excellence (NATE) are identified with the “NATE-recognized” logo. Technicians who successfully complete one or more of these instructor-led courses may receive credit toward renewing their NATE certification.

---

**R/AC UNIT 1: PRINCIPLES OF REFRIGERATION**

32 hours, 3.2 CEUs

This Unit of study 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.

**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

---

**REFRIGERATION & AIR CONDITIONING (R/AC) TRAINING COURSE**

**6 UNITS OF STUDY**

---

<table>
<thead>
<tr>
<th>Item# 720-901X</th>
<th>Member</th>
<th>$65.00</th>
</tr>
</thead>
<tbody>
<tr>
<td>Item# 720-951X</td>
<td>Instructor Edition</td>
<td>$55.00</td>
</tr>
<tr>
<td>Item# 720-901Z</td>
<td>Final Exam</td>
<td>$50.00</td>
</tr>
</tbody>
</table>
R/AC UNIT 2: COMPRESSORS, CONDENSERS, AND COOLING TOWERS
36 hours, 3.6 CEUs

This Unit 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.

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

R/AC UNIT 3: EVAPORATORS AND SYSTEM COMPONENTS
38 hours, 3.8 CEUs

This Unit provides instruction in the areas of refrigeration 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, thermostatic 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.

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

R/AC UNIT 4: TOOLS, CONTROLS, AND TROUBLESHOOTING
42 hours, 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.

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
R/AC UNIT 4: TOOLS, CONTROLS, AND TROUBLESHOOTING
(continued)

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

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)

R/AC UNIT 5: AIR CONDITIONING PRINCIPLES
37 hours, 3.7 CEUs

This Unit of study 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.

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)

Item# 720-904X
Member .......................... $65.00
Corporate member ............... $65.00
Nonmember ..................... $95.00
Student Edition/School .......... Chapter officer call for pricing
Item# 720-954X
Instructor Edition ................ $55.00
Item# 720-904Z
Final Exam ...................... $50.00

Item# 720-905X
Member .......................... $65.00
Corporate member ............... $65.00
Nonmember ..................... $95.00
Student Edition/School .......... Chapter officer call for pricing
Item# 720-955X
Instructor Edition ................ $55.00
Item# 720-905Z
Final Exam ...................... $50.00

R/AC UNIT 6: HEAT TRANSFER AND DISTRIBUTION
32 hours, 3.2 CEUs

This Unit of study 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.

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)
ELECTRICITY TRAINING COURSE

5 UNITS OF STUDY

ELECTRICITY UNIT 1: INTRODUCTION TO ELECTRICITY
25 hours, 2.5 CEUs

This Unit of study 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.

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

ELECTRICITY UNIT 2: ELECTRICAL COMPONENTS
32 hours, 3.2 CEUs

This Unit of study 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.

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

Pricing subject to change. Shipping and handling apply to all orders.
ELECTRICITY UNIT 3: BASIC ELECTRONICS
40 hours, 4.0 CEUs

Beginning with a review of the basics, this Unit 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.

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

NOTE
The Lessons listed above are the same as those that make up Controls Unit 4 (see page 18).

ELECTRICITY UNIT 4: TROUBLESHOOTING COMPONENTS
44 hours, 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 Unit of study.

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# 730-904X
Member . . . . . . . . . . . . . . . . . . . . . . . . . $65.00
Corporate member . . . . . . . . . . . . . . . . . . $65.00
Nonmember . . . . . . . . . . . . . . . . . . . . . . . $95.00
Student Edition/School . . . . . . . . . . . . . . $55.00
Student Edition/Chapter . . . . . . . . . . . . . call for pricing

Item# 730-954X
Instructor Edition . . . . . . . . . . . . . . . . . . . $55.00

Item# 730-904Z
Final Exam . . . . . . . . . . . . . . . . . . . . . . . . $50.00

ELECTRICITY UNIT 5: TROUBLESHOOTING RESIDENTIAL EQUIPMENT
48 hours, 4.8 CEUs

This Unit of study 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# 730-905X
Member . . . . . . . . . . . . . . . . . . . . . . . . . $65.00
Corporate member . . . . . . . . . . . . . . . . . . $65.00
Nonmember . . . . . . . . . . . . . . . . . . . . . . . $95.00
Student Edition/School . . . . . . . . . . . . . . $55.00
Student Edition/Chapter . . . . . . . . . . . . . call for pricing

Item# 730-955X
Instructor Edition . . . . . . . . . . . . . . . . . . . $55.00

Item# 730-905Z
Final Exam . . . . . . . . . . . . . . . . . . . . . . . . $50.00
CONTROLS UNIT 1: FUNDAMENTALS OF CONTROLS
30 hours, 3.0 CEUs

This Unit of study introduces the various types of controls found in HVACR equipment. Beginning with the types of mechanical equipment, the Unit 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.

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

CONTROLS UNIT 2: PNEUMATIC CONTROLS
40 hours, 4.0 CEUs

This Unit of study 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.

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
CONTROLS UNIT 3: ELECTROMECHANICAL CONTROLS
40 hours, 4.0 CEUs

Beginning with electrical safety, this Unit of study 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.

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

NOTE: The Lessons listed above are the same as those that make up Electricity Unit 3 (see page 16).

CONTROLS UNIT 4: BASIC ELECTRONICS FOR CONTROLS
40 hours, 4.0 CEUs

This Unit of study begins with a review of the basics and progresses to solid-state fundamentals, diodes and power supplies, power supply regulation and filtration, transistors, silicon-controlled rectifiers, triacs, diacs, solid-state relays, Peltier diodes, protective devices, number systems, logic circuits, digital integrated circuits, analog integrated circuits, and microprocessors and computers.

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

CONTROLS UNIT 5: ELECTRONIC PROPORTIONAL CONTROLS
40 hours, 4.0 CEUs

This stand-alone Unit of study contains some of the same subject matter covered in Controls Unit 4. Additional material includes measuring circuits, installation and wiring techniques, ac power and grounding practices, basic electronic troubleshooting, electronic controllers, adapters, and indicators, and final control devices.

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)
HEATING UNIT 1: HEATING FUNDAMENTALS
36 hours, 3.6 CEUs
This Unit of study introduces the student to 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.

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

HEATING UNIT 2: ELECTRIC HEATING
36 hours, 3.6 CEUs
This Unit of study 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, multi-step controllers, electronic sequencing controls, decentralized electric heating systems, and electric boilers.

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
HEATING UNIT 3: GAS HEATING
32 hours, 3.2 CEUs

This Unit of study explores the concepts of heating with gas. Included in this Unit are Lessons related 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.

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

HEATING UNIT 4: OIL HEATING
36 hours, 3.6 CEUs

This comprehensive Unit of study 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.

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
HEATING UNIT 5: HOT WATER HEATING
38 hours, 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.

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

HEATING UNIT 6: STEAM HEATING
38 hours, 3.8 CEUs

This Unit of study begins with basic steam and one-pipe heating systems. Included in this Unit are 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.

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# 750-906X
Member ........................................ $65.00
Corporate member .......................... $65.00
Nonmember .................................. $95.00
Student Edition/School .................. $55.00
Student Edition/Chapter .................. Chapter officer call for pricing

Item# 750-906Z
Final Exam .................................. $50.00
HEAT PUMP TRAINING COURSE
128 hours, 12.8 CEUs

Written for those individuals who already have a basic background in refrigeration and air conditioning, this two-volume course 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. Note: This course is sold only as a two-volume set. Volumes are not available individually.

VOLUME 1

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

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

NOTE
This course is priced and sold only as a two-volume set. Volumes are not available individually.
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.

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# 360-201X
Member ........................................ $95.00
Corporate member ........................... $95.00
Nonmember ................................... $125.00
Student Edition/Chapter ................. Chapter officer
call for pricing

Item# 360-251X
Instructor Edition .......................... $100.00

Item# 360-201Z
Final Exam ................................... $50.00

CD-ROM Edition also available
(see page 28).

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.
estimating heat loads, residential air conditioning, humidification and a review of safety codes.

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  Psychrometrics
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

RSES TECHNICAL INSTITUTE TRAINING MANUAL 3
72 hours, 7.2 CEUs

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.

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

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. Featured in this manual are a number of 11 × 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# 360-203X
Member ............................................. $95.00
Corporate member ................................ $95.00
Nonmember ....................................... $125.00
Student Edition/School ........................ $85.00
Student Edition/Chapter ......................... Chapter officer call for pricing

Item# 360-253X
Instructor Edition ................................ $100.00
Item# 360-283Z
Final Exam ............................................. $50.00

CD-ROM Edition also available (see page 28).

Pricing subject to change. Shipping and handling apply to all orders.
CBT³ (Computer-Based Technician Training and Troubleshooting), from the RSES Technical Institute, is a line of interactive CD-ROMs created for today’s HVACR service professional. Each CD offers self-paced study, simple navigation tools, interactive troubleshooting exercises, animated visual graphics, and clear and concise audio lectures. Four titles available.

Minimum system requirements for each of the CBT³ CD-ROMs are:
- Processor: 486 Pentium®, 100 MHz or higher
- Hard drive: 41 MB available space
- CD-ROM drive: 2x or higher
- RAM: 16 MB
- Other: 16-bit sound card with speakers, 256-color display (640 × 480 or higher recommended), mouse

Start with a basic introduction to refrigerants and finish by troubleshooting R-22 and R-410A refrigeration circuit problems. This CD is packed full of information on heat transfer, saturated refrigerants, evaporators, condensers, and specific service practices relating to R-22 and R-410A. It also includes several interactive diagnostic service call exercises.

Topics covered in depth include introduction to refrigerants, mechanical refrigeration cycle, the evaporator coil, the condenser coil, diagnostics, and interactive practices for R-22/R-410A.

Item# 360-901X
Member . . . . . . . . . . . . . . . . . . . . . . . . . . $80.00
Corporate member . . . . . . . . . . . . . . . . . . $80.00
Nonmember . . . . . . . . . . . . . . . . . . . . . . . $110.00
School . . . . . . . . . . . . . . . . . . . . . . . . . . . $80.00

Note: All CD/DVDs are nonreturnable and nonrefundable.
ELECTRICAL TROUBLESHOOTING: RESIDENTIAL SPLIT-SYSTEM AIR CONDITIONING

Learn about line voltage to the condensing unit and air handler, low-voltage field-installed wiring, the residential split-system condensing unit’s low-voltage and high-voltage circuits, and the residential split-system indoor air handler’s electrical systems. Increase your understanding of electrical troubleshooting topics by accessing the video library, and learn how to diagnose and fix practical problems through interactive problem-solving exercises.

Topics covered in depth include field line voltage, field low voltage, outdoor condensing units, and indoor air handlers. The CD also contains a comprehensive video clip library.

<table>
<thead>
<tr>
<th>Item# 360-902X</th>
<th>Member</th>
<th>Corporate member</th>
<th>Nonmember</th>
<th>School</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$80.00</td>
<td>$80.00</td>
<td>$110.00</td>
<td>$80.00</td>
</tr>
</tbody>
</table>

Note: All CD/DVDs are nonreturnable and nonrefundable.

GAS FURNACES: INTERMITTENT SPARK-IGNITION SYSTEMS

Learn how to troubleshoot intermittent spark-ignition gas furnace systems by using this CD. Get a better understanding of the combustion process, sources of combustion air, fuel delivery, manifold and burner assemblies, spark-ignition systems, and more. Enhance your learning experience with quizzes at the end of each topic, a test procedure video clip library, and 25 interactive diagnostic service calls featuring the Robertshaw Uni-Line 712 Series spark-ignition system.

Topics covered in depth include combustion air, fuel delivery and regulation systems, spark-ignition system operating principles, and interactive spark-ignition troubleshooting.

<table>
<thead>
<tr>
<th>Item# 360-903X</th>
<th>Member</th>
<th>Corporate member</th>
<th>Nonmember</th>
<th>School</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$80.00</td>
<td>$80.00</td>
<td>$110.00</td>
<td>$80.00</td>
</tr>
</tbody>
</table>

AIRFLOW CHARACTERISTICS AND DIAGNOSTICS

Explore the fundamentals of air movement. Learn how to determine duct size. Understand how duct size, velocity, and air volume interact. Study the basic design conditions that must be present for duct systems to function properly, basic airflow design limits, and the methods of identifying and correcting airflow problems. Increase your knowledge or brush up on your skills by utilizing quizzes or interactive practices in each category section throughout the CD.

Topics covered in depth include basic airflow characteristics, how air velocity, duct size, and air volume are related, air volume levels and measurement, air systems and basic application theory, and interactive practices.

<table>
<thead>
<tr>
<th>Item# 360-904X</th>
<th>Member</th>
<th>Corporate member</th>
<th>Nonmember</th>
<th>School</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$80.00</td>
<td>$80.00</td>
<td>$110.00</td>
<td>$80.00</td>
</tr>
</tbody>
</table>

Pricing subject to change. Shipping and handling apply to all orders.
400+ pages of material can be a little overwhelming outside the structure of a classroom. This interactive CD-ROM edition features audio lectures, colorful graphics, animation, and interactive quizzes. You can select the CD-only option (a 12-CD set for each training manual) or, if you prefer, you can order the manual of your choice plus the 12-CD set. Regardless of your choice, the CD-ROM edition provides self-paced learning that is convenient for you anytime, anywhere.

The CD-ROM edition operates on Microsoft® Windows® 95, Windows 98, Windows 2000, Windows XP, or Windows NT® (currently not compatible with 64-bit Windows Vista). The minimum system configuration is Pentium® II (250 MHz) with 32 MB of RAM and at least 30 MB of hard drive space per CD. A 16-bit sound card, an 8x CD-ROM drive, and a monitor with 256-color VGA capabilities are recommended.

**Training Manual 1**

Option #1: CD only (12-CD set)

- **Item# 380-311Y**  
  - Member: $95.00  
  - Corporate member: $95.00  
  - Nonmember: $125.00  
  - Student Edition/School: $85.00  
  - Student Edition/Chapter: Chapter officer call for pricing

Option #2: Manual plus 12-CD set

- **Item# 380-311X**  
  - Member: $145.00  
  - Corporate member: $145.00  
  - Nonmember: $175.00  
  - Student Edition/School: $135.00  
  - Student Edition/Chapter: Chapter officer call for pricing

- **Item# 380-351X**  
  - Instructor Edition: $150.00

- **Item# 380-2012**  
  - Final Exam: $50.00

**Training Manual 2**

Option #1: CD only (12-CD set)

- **Item# 380-312Y**  
  - Member: $95.00  
  - Corporate member: $95.00  
  - Nonmember: $125.00  
  - Student Edition/School: $85.00  
  - Student Edition/Chapter: Chapter officer call for pricing

Option #2: Manual plus 12-CD set

- **Item# 380-312X**  
  - Member: $145.00  
  - Corporate member: $145.00  
  - Nonmember: $175.00  
  - Student Edition/School: $135.00  
  - Student Edition/Chapter: Chapter officer call for pricing

- **Item# 380-352X**  
  - Instructor Edition: $150.00

- **Item# 380-2022**  
  - Final Exam: $50.00

**Training Manual 3**

Option #1: CD only (12-CD set)

- **Item# 380-313Y**  
  - Member: $95.00  
  - Corporate member: $95.00  
  - Nonmember: $125.00  
  - Student Edition/School: $85.00  
  - Student Edition/Chapter: Chapter officer call for pricing

Option #2: Manual plus 12-CD set

- **Item# 380-313X**  
  - Member: $145.00  
  - Corporate member: $145.00  
  - Nonmember: $175.00  
  - Student Edition/School: $135.00  
  - Student Edition/Chapter: Chapter officer call for pricing

- **Item# 380-353X**  
  - Instructor Edition: $150.00

- **Item# 360-2032**  
  - Final Exam: $50.00

---

**Note:** All CD/DVDs are nonreturnable and nonrefundable.
RSES has released this group of CDs to assist RSES Chapters and HVACR industry instructors in preparing technicians for the North American Technician Excellence (NATE) series of exams.

Intended for instructors utilizing Microsoft PowerPoint, each CD provides the instructor with a tool for conducting a two- to four-hour review session. These review presentations are meant to support and reinforce instructional content. They are ideal for those instructors who have extensive knowledge in the field and are looking for an outline to follow when conducting a preparatory review for any of the NATE exams.

Topics covered on the NATE Core Service Review CD include: heat transfer and total comfort, electrical, soft skills, safety, and tools.

Topics covered on the NATE Air Conditioning Service Review CD include: fabricating copper tubing, installing condensing units, packaged units and indoor equipment, evacuation and charging, installing accessories, field wiring, start-up and checkout, refrigerant circuit tools, recovery and recycling machines, duct fabrication equipment, duct installation, air flow measurements, air balancing, preventive maintenance, and diagnostics.

Topics covered on the NATE Gas Heating Service Review CD include: types of gas-fired furnaces, fundamentals of gas combustion, heat transfer, tools of the trade, gas components, installing gas-fired furnaces, installation accessories, troubleshooting, combustion testing, planned maintenance inspections, and sizing furnaces.

Topics covered on the NATE Heat Pump Service Review CD include: heat pumps versus standard air conditioners, sizing heat pumps, defrost systems, installing split-system heat pumps, troubleshooting, and planned maintenance inspections.

Topics covered on the NATE Air Distribution Service Review CD include: duct fabrication equipment, fabrication techniques for metal duct and ductboard, installing metal duct, flexible duct, ductboard, grilles, registers, and more.

These CDs are designed to assist technicians in preparing to take the North American Technician Excellence (NATE) series of exams.

Intended for technicians utilizing Microsoft PowerPoint software, these review presentations are ideal for technicians who feel they are prepared to participate in the NATE exam. Review presentations are self-paced, concentrating on one specific area per CD, and include an optional audio feature for each presentation slide.

Topics covered on the NATE Core Service Review CD include: heat transfer and total comfort, electrical, soft skills, safety, and tools.

Topics covered on the NATE Air Conditioning Service Review CD include: fabricating copper tubing, installing condensing units, installing packaged units and indoor equipment, evacuation and charging, leak checking and detection, installing accessories, field wiring, start-up and checkout, refrigerant circuit tools, recovery and recycling machines, duct fabrication equipment, duct installation, air flow measurements, air balancing, preventive maintenance, and diagnostics.

Note: All CD/DVDs are nonreturnable and nonrefundable.
NATE SERVICE REVIEW
(continued)

Topics covered on the NATE Air Distribution Service Review CD include: duct fabrication equipment, fabrication techniques for metal duct and ductboard, installing metal duct, flexible duct, ductboard, grilles, registers, diffusers and dampers, chases used as ducts, reconnecting duct when replacing equipment, installing plenums, measuring air flow velocity, pressure, and volume, gathering design information, preparing systems for air tests, procedures for conducting air tests, final tests, completing appropriate forms, noise problems, high utility bills, and wide temperature swings.

Refrigerant Usage Certification Review CD

This convenient review CD utilizes Microsoft PowerPoint and is ideal for instructors who are preparing students to take an EPA Section 608 exam. The 86-slide presentation reviews Core, Type I (small appliances), Type II (high-pressure appliances), and Type III (low-pressure appliances), and can be used in conjunction with the Refrigerant Usage Certification study guide.

Universal R-410A Safety & Training CD-ROM

The Universal R-410A Safety & Training Interactive CD-ROM was adapted from the Universal R-410A Safety & Training Manual and covers the following categories: background, system fundamentals, refrigerant chemistry, refrigerant oils, safety, and a practice exam. This 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.

Minimum system requirements:
- Microsoft® Windows® 95 or better, Macintosh® PowerPC™ or better with at least 8 MB available RAM
- 20 MB hard disk space required for installation
- Monitor set to millions of colors or high color recommended

NOTE Those seeking a full training experience should consider the Residential and Light Commercial HVACR Service Technician Reference Manual/Guide to NATE Certification (see page 35).

Core, gas furnace, air distribution, and heat pump and air conditioning test refresher DVD/CDs are also available (see pages 32–33).

Item# 360-115X Core
Member . . . . . . . . . . . . . . . . . . . . $30.00
Corporate member . . . . . . . . . . . . . . $30.00
Nonmember . . . . . . . . . . . . . . . . . . . $40.00

Item# 360-116X Air Conditioning
Member . . . . . . . . . . . . . . . . . . . . $30.00
Corporate member . . . . . . . . . . . . . . $30.00
Nonmember . . . . . . . . . . . . . . . . . . . $40.00

Item# 360-117X Air Distribution
Member . . . . . . . . . . . . . . . . . . . . $30.00
Corporate member . . . . . . . . . . . . . . $30.00
Nonmember . . . . . . . . . . . . . . . . . . . $40.00

Item# 111-002X
Member . . . . . . . . . . . . . . . . . . . . $10.00
Corporate member . . . . . . . . . . . . . . $10.00
Nonmember . . . . . . . . . . . . . . . . . . . $10.00

Item# 200-410X
Member . . . . . . . . . . . . . . . . . . . . $25.00
Corporate member . . . . . . . . . . . . . . $25.00
Nonmember . . . . . . . . . . . . . . . . . . . $28.00

NOTE The Refrigerant Usage Certification study guide is also available in paperback (see page 36). In addition, RSES offers the HVAC Maestro Section 608 EPA Certification Review 2 CD (see page 34).

NOTE Corresponding print manual is also available. Refer to the “Certification Preparation and Reference Materials” section (see page 38) for more information.

Note: All CD/DVDs are nonreturnable and nonrefundable.
RSES offers various multimedia titles developed by Prokup Media, Inc.

Minimum system requirements for the three items that follow are:

**DVD**
- Plays on any standard DVD player or PC with a DVD-ROM drive

**CD-ROM**
- Intel® Pentium® 166 processor (Pentium® II 233 or higher recommended)
- 32 MB RAM
- 30 MB or more free hard disk space
- CD-ROM drive (2x or faster recommended)
- Video graphics adapter (VGA) able to display at least 256 (8-bit) colors at 640 × 480 pixel resolution
- Windows-compatible sound card

**RECIROCATING AND SCROLL COMPRESSOR TEST PROCEDURES DVD**

For residential and light commercial systems, this DVD discusses single-phase test procedures, three-phase test procedures, and general testing procedures, and includes a Tecumseh Products safety section.

No computer is necessary for this DVD, which features live video footage of actual diagnostic and maintenance procedures. Single-phase test procedure topics covered include checking for an open motor winding/internal overload, compressor electrical components, and capacitor test with Ohm function.

Three-phase test procedure topics covered include checking for an open motor winding/internal overload and checking motor windings for short to ground.

A few of the general test procedure topics covered include current relay and potential relay checks, valve plate checks, and mechanical scroll checks.

**HVAC SUPERTECH CD**

Designed for the HVAC service technician as an aid in the field, the HVAC SuperTech CD has been created to help technicians troubleshoot R-22 residential and light commercial air conditioning systems. The CD compares required conditions to field findings, thus helping the technician to diagnose systems more accurately. HVAC SuperTech allows the user to build a database of customers and equipment to assist in tracking the history of problems and solutions related to a specific customer.

Topics covered include evaporator circuit analysis, condenser circuit analysis, high/low evaporator heat load conditions, non-condensable/mixed refrigerant test, compressor valve plate test, charge analysis, indoor air flow calculation, capacity calculation procedure, liquid circuit restriction diagnostic test, and suction-line test.

<table>
<thead>
<tr>
<th>Item# 200-201X</th>
<th>Member</th>
<th>Corporate member</th>
<th>Nonmember</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$25.00</td>
<td>$25.00</td>
<td>$55.00</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Item# 200-202X</th>
<th>Member</th>
<th>Corporate member</th>
<th>Nonmember</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$50.00</td>
<td>$50.00</td>
<td>$80.00</td>
</tr>
</tbody>
</table>

Note: All CD/DVDs are nonreturnable and nonrefundable.
HVAC PERSONNEL ASSESSMENT CD

Created for HVAC contractors and service managers, this interactive CD allows you to test the knowledge of your HVAC service staff and prospective employees on topics relative to real-life HVAC field service work. Upon completion of this assessment, you will gain valuable insight into the training needs, capabilities, and experience level of individuals who work (or could potentially work) for you.

Features include multiple-choice and true-false quizzes covering such topics as thermodynamics, electrical components, and refrigeration cycle diagnostics. Interactive service call simulations challenge the user to diagnose system situations using real-world test procedures. An assessment summary page may be printed for employee or applicant records.

Minimum system requirements for the five items that follow are:

- **DVD**
  - Plays on any standard DVD player or PC with a DVD-ROM drive

- **CD-ROM**
  - 166-MHz processor (Pentium II 223 or higher recommended)
  - Windows 3.1, 95, 98, ME, 2000, XP (currently not compatible with 64-bit Windows Vista)
  - 32 MB RAM
  - VGA able to display 256 colors at 800 × 600
  - 2x CD-ROM Drive
  - Sound card

AIR VOLUME MEASUREMENT CD

Learn to calculate air volume for HVAC systems properly (including gas furnace and electric heat air handler applications) using temperature rise and external static pressure methods. Topics include: introduction to air volume, measuring air volume for gas furnaces and air handlers, external static pressure, clocking a gas meter, and temperature rise. Among the additional features are a procedure video, interactive practice, and topic quizzes.

The DVDs contain pretest review and tips on the following test topics: safety, tools and soft skills, mathematics, personal ethics and conduct, interpersonal relations, fabrication tools, handling hazardous materials, basic construction designs, heat transfer and comfort, basic science, basic electricity, ac motors, electrical diagrams, and electrical meters. Approximate playing time: Disc 1 is 90 minutes, Disc 2 is 100 minutes.

The accompanying CD contains expanded study topics, covering air properties, air volume measurement, electrical theory and components, OSHA safety materials, and superheat and subcooling. Playing time of the review CD depends on the individual’s pace.

### Item# 200-208X
- **Member** . . . . . . . . . . . . . $89.00
- **Corporate member** . . . . . . . $89.00
- **Nonmember** . . . . . . . . . . . . . $119.00

### Item# 200-209X
- **Member** . . . . . . . . . . . . . $40.00
- **Corporate member** . . . . . . . $40.00
- **Nonmember** . . . . . . . . . . . . . $70.00

**Note:** All CD/DVDs are nonreturnable and nonrefundable.
HVAC SMS NATE HEAT PUMP & AIR CONDITIONING TEST REFRESHER DVDs AND CD

The DVDs contain pretest review and tips on the following test topics: heat transfer and thermodynamics, system selection, indoor design conditions, thermostats, outdoor units, line sets, package units, indoor equipment, metering devices, accessories and dryers, leak detection and evacuation, brazing, valves, startup and charging, checking capacity, defrost controls, duct design, electrical circuits and troubleshooting, terminations, velocities, retrofitting, dual-fuel applications, and zoning. Approximate playing time: Disc 1 is 120 minutes, Disc 2 is 110 minutes.

The accompanying CD contains expanded study topics, covering piping circuit components, heat pump circuit overview, balance point, defrost board, reversing valve, check valve, suction accumulator, heat transfer, metering devices, evaporator and condenser circuits, suction and liquid lines, and superheat and subcooling. Playing time of the review CD depends on the individual’s pace.

Item# 200-207X
Member ........................................... $89.00
Corporate member ........................... $89.00
Nonmember ..................................... $119.00

HVAC SMS NATE GAS FURNACE TEST REFRESHER DVD AND CD

The DVD contains pretest review and tips on the following test topics: configurations and accessories, the combustion process, flame proofing, drafts and vents, field wiring, gas piping and valves, startup and combustion analysis, accessories, troubleshooting, customer satisfaction, carbon monoxide, dual-fuel and commercial applications, air dilution, and controls. Approximate playing time: 110 minutes.

The accompanying CD contains expanded study topics, covering fuels and combustion, ignition sources, furnace components, installation, and a practice quiz. Playing time of the review CD depends on the individual’s pace.

Item# 200-206X
Member ........................................... $89.00
Corporate member ........................... $89.00
Nonmember ..................................... $119.00

HVAC SMS NATE AIR DISTRIBUTION TEST REFRESHER DVDs

The two DVDs contain pretest review and tips on the following test topics: air handling units, general ductwork, flex duct, spiral duct, air socks, duct board, sheet metal, terminal devices, system design, troubleshooting, efficiencies, fan laws, balancing, and duct leakage. Approximate playing time: Disc 1 is 60 minutes, Disc 2 is 30 minutes.

The accompanying CD contains expanded study topics, covering fuels and combustion, ignition sources, furnace components, installation, and a practice quiz. Playing time of the review CD depends on the individual’s pace.

Item# 200-210X
Member ........................................... $89.00
Corporate member ........................... $89.00
Nonmember ..................................... $119.00

NOTE
Those seeking a full training experience should consider the Residential and Light Commercial HVACR Service Technician Reference Manual/Guide to NATE Certification (see page 35).

NATE Service Reviews are also available on CD-ROM (see pages 29–30).

Note: All CD/DVDs are nonreturnable and nonrefundable.
RSES is distributing Axxess Media Interactive programs to RSES members at discounted prices. The HVAC MAESTRO series is designed to help the professional HVAC service technician gain confidence in the field, leading to greater efficiency on the job, fewer callbacks, and more satisfied customers.

The DVD and CD-ROM volumes are written in an easy-to-follow, logical format, and contain information that plays a critical part in the effectiveness and proficiency of the service technician.

Minimum system requirements:
- DVD: Plays on any standard DVD player or PC with a DVD-ROM drive
- CD-ROM: Windows PC (98, NT, ME, 2000, XP), CD-ROM drive (4x or faster), Macromedia Flash Player 8 or higher, 800 × 600 display or larger, Adobe Acrobat Reader 4 or higher

This DVD provides essential information that every service technician must possess in order to become effective. Furnace components are reviewed in depth, along with critical set-up information. An emphasis is placed on understanding the sequence of operation of the equipment being serviced. Four different ignition systems are covered in detail (HSI, DSI, HSP, and spark-to-pilot), with diagnostic procedures on each.

This is a full-featured DVD with topics separated by instantly accessible chapters, English subtitles, and more. It offers installation technicians an excellent opportunity to better understand the diagnostic procedures required to be a service technician. At less than the cost of one unnecessary callback, this volume is a must-have for your service library!

HVAC MAESTRO GAS FURNACES DVD

Currently in use by technical colleges throughout the U.S., this CD-ROM for Windows prepares you to take the EPA’s Section 608 exam, which is required for all technicians opening the refrigerant side of an A/C or refrigeration system.

The program takes you through all of the necessary knowledge—from ozone depletion theory to regulations to required service practices. It is a self-paced presentation with narration and audio that is controllable by the user. Test your knowledge of the required topics with four interactive quizzes that are different every time you take them, and another quiz on recovery machine requirements.


HVAC MAESTRO SECTION 608 EPA CERTIFICATION REVIEW 2

Note: All CD/DVDs are nonreturnable and nonrefundable.
Based on the structure of the NATE service exams, this manual covers material pertaining to its core and the following specialty areas: air distribution, air conditioning, gas heating, oil heating, and heat pumps. Appendices include an HVACR glossary, common equations/equivalents/conversions, symbols, and many P-T charts, making this manual—known in the trade as the “yellow book”—extremely beneficial as field reference for all residential and light commercial service professionals!

Contents:
Section One: Core
Chapter 1 Safety
Chapter 2 Heat and Matter
Chapter 3 Basic Gas Laws
Chapter 4 Electrical Conductors
Chapter 5 Electrical Fundamentals
Chapter 6 Test Instruments
Chapter 7 Inductors and Inductance
Chapter 8 Capacitors and Capacitance
Chapter 9 Circuit Protection Devices
Chapter 10 Transformers and Motors
Chapter 11 Control Devices
Chapter 12 Safety Controls
Chapter 13 Thermostats
Chapter 14 Indoor Air Quality
Chapter 15 Ice Machines
Section Two: Air Distribution
Chapter 1 Fan and Blowers
Chapter 2 Fan Performance
Chapter 3 Fan Selection
Chapter 4 Fan and Blower Applications
Chapter 5 Fan and Blower Maintenance
Chapter 6 Duct System Components
Chapter 7 Resistance to Air Flow in Duct Systems
Chapter 8 Types of Duct Systems
Chapter 9 Duct Fittings
Chapter 10 Principles of Room Air Distribution
Section Three: Air Conditioning
Chapter 1 System Components
Chapter 2 Refrigerant Controls
Chapter 3 Refrigerants and Their Properties
Chapter 4 Recover, Recycle, Reclaim
Chapter 5 Piping and Leak Testing
Chapter 6 System Evacuation
Chapter 7 Psychrometrics
Chapter 8 Refrigerant Circuit Diagnosis
Chapter 9 Motor Diagnosis
Chapter 10 Mechanical Diagnosis
Section Four: Gas Heating
Chapter 1 Introduction to Gas Heating
Chapter 2 Combustion Air Requirements
Chapter 3 Ignition Control Systems
Chapter 4 Installing Gas Furnaces
Chapter 5 Venting Requirements
Chapter 6 Start-Up and Checkout
Chapter 7 Diagnostics and Repair
Chapter 8 Induced-Draft Condensing Operation
Section Five: Oil Heating
Chapter 1 Oil Furnace Combustion
Chapter 2 Installing Oil Tanks
Chapter 3 Venting
Chapter 4 Combustion Chambers
Chapter 5 Installing Accessories
Chapter 6 Preventive Maintenance
Chapter 7 Diagnostics and Repair
Section Six: Heat Pumps
Chapter 1 Introduction to Heat Pumps
Chapter 2 Heat Pump Fundamentals
Chapter 3 Reversing Valves
Chapter 4 Heat Pump Installation
Chapter 5 Start-Up Procedures
Chapter 6 Defrost Cycle
Chapter 7 Performance Analysis
Chapter 8 Troubleshooting Heat Pumps
Appendices
Appendix A Glossary of Terms
Appendix B Equations, Equivalents, Conversions
Appendix C Symbols
Appendix D Refrigerant Pressure-Temperature Tables
Appendix E Answers

RSES has materials for many industry programs. Whether you’re seeking Certificate Member (CM) or Certificate Member Specialist (CMS) status, Environmental Protection Agency (EPA) Section 608 refrigerant-handling certification, North American Technician Excellence (NATE) certification, R-410A certification, or just need additional reference materials, RSES can help!

NOTE
Item# 360-103A
Member ........................................ $59.00
Corporate member ................................ $59.00
Nonmember ....................................... $89.00

NATE Service Reviews are also available on CD-ROM (see pages 29–30). Core, gas furnace, air distribution, and heat pump and air conditioning test refresher DVD/CDs are available as well (see pages 32–33).

Pricing subject to change. Shipping and handling apply to all orders.
SAFETY FOR THE HVACR SERVICE TECHNICIAN

To address the increasingly important need to keep heating, ventilation, air conditioning, and refrigeration technicians safe in the field, RSES is offering its brand new 165-page book entitled Safety for the HVACR Service Technician.

Topics covered in this four-color book include job site safety, personal protective equipment, tools and instruments, fan safety, cylinder handling, soldering and brazing, fire safety, material handling, first aid, and more.

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!

REFRIGERANT USAGE CERTIFICATION

This study guide for service technicians follows the EPA's Section 608 program structure, progressing in order through Core, Type I (small appliances), Type II (high-pressure systems), and Type III (low-pressure systems). It allows focused study in the specific area of certification being sought and contains updated information regarding phase-outs.

NOTE The Residential and Light Commercial HVACR Service Technician Reference Manual/Guide for NATE Certification (see page 35) contains many of these same materials in its Appendices.

EPA Section 608 CDs are also available. Refer to the “CD/DVD Training and Reference” section (see pages 30 and 34) for more information.
RSES offers the ever-popular Manual J to its members. Published by Air Conditioning Contractors of America (ACCA), the new 8th Edition of Manual J has been completely revised and expanded. Also included is a new electronic spreadsheet that makes calculations easier. Manual J is the industry-standard residential load calculation manual. Today many building codes require Manual J to be used in the design and installation of HVAC systems. The latest edition contains greater flexibilities and sensitivities to new construction materials and methods.

Item# 200-008X
Member . . . . . . . . . . . . . . . . . . . . . . . . . . $89.00
Corporate member . . . . . . . . . . . . . . . . . $89.00
Nonmember . . . . . . . . . . . . . . . . . . . . . . . . . . $119.00


Published by Air Conditioning Contractors of America (ACCA), the Manual J-8 Abridged Edition is a condensed version that makes learning MJ8 procedures and hand calculation methods easier.

(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 ACCA Manual J, 8th Edition.)

Item# 200-008A
Member . . . . . . . . . . . . . . . . . . . . . . . . . . $49.00
Corporate member . . . . . . . . . . . . . . . . . $49.00
Nonmember . . . . . . . . . . . . . . . . . . . . . . . . . . $79.00

Developed to accompany ASHRAE Standard 15-2001, this user’s manual explains the meaning of the standard and the reasoning behind it. Suitable for use as a self-study tool, the book includes explanations of and supporting references for formulas in the standard, as well as examples and illustrations of accepted industry methods. The manual covers residential, commercial, and industrial refrigeration systems and their applications.

Item# 200-093X
Member . . . . . . . . . . . . . . . . . . . . . . . . . . $47.00
Corporate member . . . . . . . . . . . . . . . . . $47.00
Nonmember . . . . . . . . . . . . . . . . . . . . . . . . . . $59.00
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. This study guide, published by ESCO Press and made available as a convenience to RSES members, prepares technicians for a certification exam (available separately). Call RSES for more details on exams in your area.

**UNIVERSAL R-410A SAFETY & TRAINING**

The DEWALT® HVAC Certification Exam Guide is the most complete and comprehensive HVAC technician certification book available. This new “standard” for the climate control industry will help readers pass the NATE, ICE, RSES Certification, HVAC Excellence, and HVAC Technician Licensing Exams. Innovative coverage also makes this exam guide extremely useful for studying and preparing for the state limited energy license and HVAC contractor licenses. Features:

- Covers all HVAC licensing and certification exams in one complete volume.
- Explains all of the certification options available, assisting readers in choosing the one that best suits their needs.
- Realistic sample exams help readers put their skills to the test.
- Includes effective study tips and reference material for surefire success.
- Content is completely current and up-to-date with industry standards.
- Large and easy-to-read text makes finding information a breeze.

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.
Whether it’s a cap or a shirt, a mug or a lapel pin, RSES merchandise gives you a way to show your customers that you’re committed to HVACR service excellence!

**GOLF SHIRT**

*With Pocket*

This 100% combed cotton golf shirt features the RSES logo, birdseye stripe collar and cuffs, chest pocket, extended tail, and two-button placket with horn tone buttons.

<table>
<thead>
<tr>
<th>Item# 407-005</th>
<th>Price</th>
<th>Colors:</th>
<th>Sizes:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$30.00</td>
<td>Black, Chino, Green, Red, Royal Blue</td>
<td>Medium, Large, X-Large, XX-Large</td>
</tr>
</tbody>
</table>

**GOLF SHIRT**

*No Pocket*

This 100% preshrunk cotton golf shirt features the RSES logo, three-button placket, and accent colors on the collar and cuffs.

<table>
<thead>
<tr>
<th>Item# 407-002</th>
<th>Price</th>
<th>Colors:</th>
<th>Sizes:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$20.00</td>
<td>Black/Sand, Grey/Navy, Navy/Sand, Navy/White, White/Indigo, White/Sand</td>
<td>Medium, Large, X-Large, XX-Large</td>
</tr>
</tbody>
</table>

**SHORT-SLEEVE TWILL SHIRT**

This 100% cotton short-sleeve twill shirt features the RSES logo, chest pocket, seven-button placket, and an oversized fit for a roomy comfort.

<table>
<thead>
<tr>
<th>Item# 407-004</th>
<th>Price</th>
<th>Colors:</th>
<th>Sizes:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$30.00</td>
<td>Black, Dark Tan, Light Tan</td>
<td>Medium, Large, X-Large, XX-Large</td>
</tr>
</tbody>
</table>
LONG SLEEVE DRESS SHIRT

This long-sleeve dress shirt featuring the RSES logo is an easy-care blend of 70% cotton and 30% polyester. Included is a two-button adjustable cuff with single-button cuff placket, chest pocket with pencil opening, double-row top-stitching detail, and double-stitched yoke back with double-pleat detailing.

Item# 407-003 ........................ Price $30.00

Colors: French Blue, Light Blue, White
Sizes: Medium, Large, X-Large, XX-Large

T-SHIRT WITH POCKET

This 100% preshrunk cotton t-shirt features the RSES logo and chest pocket.

Item# 407-001 ........................ Price $15.00

Colors: Black, Forest Green, Heather, Light Blue, Navy, Red, Royal Blue
Sizes: Medium, Large, X-Large, XX-Large

MICROFIBER JACKET

This jacket featuring the RSES logo is constructed of water-resistant 65% polyester and 35% cotton poplin. The poplin-lined jacket includes two front pockets with snaps, one inner pocket with zipper, collar with extended closure button, and rib on cuffs and waistband.

Item# 408-003 ........................ Price $35.00

Colors: Black, Forest Green, Navy, Red, Sand
Sizes: Medium, Large, X-Large, XX-Large
PRO-STYLE WOOL CAP

This cap features A-Flex, providing a flexible, pro-fitted look without straps. The six-panel RSES logo cap includes eight rows of stitching on the visor and matching color under the visor. Constructed of 86% acrylic, 10% wool, and 4% spandex, the seamed front panel with full buckram cap includes six embroidered eyelets and pro stitch on the crown.

Item# 408-002 ........................ Price $15.00

Colors: Black, Khaki, Navy, Red, Royal Blue
Sizes: S/M fits 6 3/8 in. to 7 1/4 in.
L/XL fits 7 1/4 in. to 7 3/4 in.

AIR MESH CAP

This cap features A-Flex, providing a flexible pro-fitted look without straps. The six-panel RSES logo cap includes six rows of stitching on the visor and matching color under the visor. Seamed front panel is constructed of 100% cotton with full buckram and includes two embroidered eyelets. Back panels are constructed of 100% polyester and include pro stitch on the crown.

Item# 408-001 ........................ Price $15.00

Colors: Black, Khaki, Navy, Red, Royal Blue
Sizes: S/M fits 6 3/8 in. to 7 1/4 in.
L/XL fits 7 1/4 in. to 7 3/4 in.

TWO-TONE PROFESSIONAL WATCH

This men’s watch features a matte silver bass case with sporty bezel ring, high-accuracy quartz movement, mineral crystal scratch-resistant lens, and stainless steel band. 1 ATM water-resistant and shockproof. Lifetime warranty.

Item# 407-212X ........................ Price $25.00

Pricing subject to change. Shipping and handling apply to all orders.
RSES WRITING SET

This three-piece rosewood set includes pen, pencil, and letter opener in a beautiful rosewood display case. Set includes pewter accents and a laser engraved RSES logo on all three pieces. It displays beautifully on your desk while being functional for everyday use. Makes a great gift for any occasion.

MEMBER PATCH

This new 4½-in. x 3-in. patch replaces the Embroidered Shoulder Patch. The new woven shoulder patch has been designed to match the RSES membership card.

<table>
<thead>
<tr>
<th>Item# 407-150X</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$3.00</td>
</tr>
</tbody>
</table>

CERTIFICATE MEMBER SPECIALIST (CMS) PATCH

This new 4½-in. x 3½-in. patch replaces the Embroidered Shoulder Patch and CMS stripe. The new woven shoulder patch, designed to match the RSES membership card, displays the progression from CM to CMS status.

<table>
<thead>
<tr>
<th>Item# 407-152X</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$3.00</td>
</tr>
</tbody>
</table>

MEMBER PATCH

For today’s teaching environment, a convenient yet powerful red laser beam puts emphasis right where you need it. Gold RSES logo featured on pen barrel.

<table>
<thead>
<tr>
<th>Item# 407-221X</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$10.00</td>
</tr>
</tbody>
</table>
TECHNICAL INSTITUTE PATCHES

Wear your professionalism on your sleeve! All active RSES members are automatically Level I technicians in the Technical Institute. As you pass the Final Exams from the RSES Technical Institute HVAC/R Training Manuals, you advance from one level to the next.

Levels of the Technical Institute:
- Student—Any student currently pursuing the HVAC/R trade
- Level I (Technician)—Active RSES member
- Level II (Advanced Tech)—Active RSES member who has passed one TI Manual Final Exam
- Level III (Advanced Tech II)—Active RSES member who has passed two TI Manual Final Exams
- Level IV (Advanced Tech CM)—Active RSES member who has passed the CM Exam
- Level V (Mastertech Specialist)—Active RSES member who has passed one of the CMS Exams

<table>
<thead>
<tr>
<th>Item# (see below)</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>Student</td>
<td>$5.00</td>
</tr>
<tr>
<td>Level I</td>
<td>$5.00</td>
</tr>
<tr>
<td>Level II</td>
<td>$5.00</td>
</tr>
<tr>
<td>Level III</td>
<td>$5.00</td>
</tr>
<tr>
<td>Level IV</td>
<td>$5.00</td>
</tr>
<tr>
<td>Level V</td>
<td>$5.00</td>
</tr>
</tbody>
</table>

LAPEL PIN

This new 1-in. × 1⁄4-in. enamel logo pin includes push pin back and clasp. Display this pin proudly on your jacket, hat, plaque, or anywhere.

<table>
<thead>
<tr>
<th>Item# 406-006X</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$2.00</td>
</tr>
</tbody>
</table>

CERTIFICATE MEMBERSHIP RING

10K Gold or Sterling Silver

There’s no better way to reward yourself for achieving CM (Certificate Member) status than this handsome ring, available in 10K gold or sterling silver. Traditionally styled, the ring features a beautiful green Shamrock Spinel gemstone.

Full-cut, best-quality diamonds are also available for mounting on your ring once you have successfully completed one or more CMS (Certificate Member Specialist) exams. Up to ten diamonds can be mounted on a ring. To add diamonds to an existing ring, contact RSES. Please indicate ring size when placing your order.

<table>
<thead>
<tr>
<th>Item# 407-102X</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>10K Gold ring</td>
<td>Call for pricing</td>
</tr>
<tr>
<td>Item# 407-104X</td>
<td>Price</td>
</tr>
<tr>
<td>Sterling Silver</td>
<td>Call for pricing</td>
</tr>
<tr>
<td>Item# (see below)</td>
<td>Price</td>
</tr>
<tr>
<td>Add diamonds</td>
<td>(per diamond) $75.00</td>
</tr>
</tbody>
</table>

Diamonds | 10K Gold | Sterling Silver |
--- | ------- | --------------- |
1 | 407-102A | 407-104A |
2 | 407-102B | 407-104B |
3 | 407-102C | 407-104C |
4 | 407-102D | 407-104D |
5 | 407-102E | 407-104E |
6 | 407-102F | 407-104F |
7 | 407-102G | 407-104G |
8 | 407-102H | 407-104H |
9 | 407-102I | 407-104I |
10 | 407-102J | 407-104J |

<table>
<thead>
<tr>
<th>Item# 407-106x</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>Three initials</td>
<td>$5.00</td>
</tr>
</tbody>
</table>

NOTE

Personalize your ring by having your initials engraved inside! Be sure to indicate up to three initials in the “Special notes” section of the order form.
CMS PLAQUE

Walnut plaque features gold plate with black screened background, laser-engraved name and year, and screened color for the Society name, RSES logo, and specialty. Screen colors include: HVACR Electrical Specialist (gray), Commercial Refrigeration Specialist (red), Commercial Air Conditioning Specialist (blue), Domestic Service Specialist (yellow), Heating Specialist (green), Controls Specialist (orange), Heat Pump Specialist (brown), and Dynamic Compression Specialist (purple).

**NOTE**

<table>
<thead>
<tr>
<th>Item# (see below)</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>Item# 406-190X</td>
<td>$65.00</td>
</tr>
<tr>
<td>Item# 406-191X</td>
<td></td>
</tr>
<tr>
<td>Item# 406-192X</td>
<td></td>
</tr>
<tr>
<td>Item# 406-193X</td>
<td></td>
</tr>
<tr>
<td>Item# 406-194X</td>
<td></td>
</tr>
<tr>
<td>Item# 406-195X</td>
<td></td>
</tr>
<tr>
<td>Item# 406-196X</td>
<td></td>
</tr>
<tr>
<td>Item# 406-197X</td>
<td></td>
</tr>
</tbody>
</table>

Individual must be a CMS in order to purchase this plaque.

BUBBA KEG

Holds 52 ounces, has a flip top and spill-proof screw on lid. Stainless steel and black plastic construction.

**NOTE**

<table>
<thead>
<tr>
<th>Item# 407-208X</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>Item# 407-209X</td>
<td>$9.00</td>
</tr>
</tbody>
</table>

BUBBA KEG JR.

Holds 20 ounces, has a flip top and spill-proof screw on lid. Stainless steel and black plastic construction.

**NOTE**

<table>
<thead>
<tr>
<th>Item# 407-083X</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>Item# 407-210X</td>
<td>$25.00</td>
</tr>
</tbody>
</table>

BUBBA KEG COMBO

Get both the 52-ounce Bubba Keg and the 20-ounce Bubba Keg Jr. for one low price!

**NOTE**

<table>
<thead>
<tr>
<th>Item# 407-210X</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>Item# 407-083X</td>
<td>$25.00</td>
</tr>
</tbody>
</table>

“MAGIC” COFFEE CUP

Featuring the RSES logo on one side, with a “hidden” diagram of the vapor compression refrigeration cycle on the other that appears when hot liquid fills the cup. A great conversation starter!

**NOTE**

<table>
<thead>
<tr>
<th>Item# 407-210X</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>Item# 407-083X</td>
<td>$25.00</td>
</tr>
</tbody>
</table>
Members in good standing may use the RSES logo on business cards, stationery, service vehicles, uniforms, business-related advertising, etc. Supplied in electronic form via e-mail. Usage of the RSES member logo is subject to the following section of the RSES Bylaws:

**ARTICLE III: MOTTO, EMBLEM, VISION STATEMENT, AND MISSION STATEMENT**

Section 2 – Name and Emblem of the Society. The name and emblem of the Society are registered trademarks of the Society. Members in good standing are granted a license to use such trademarks on business cards, stationery, service vehicles, uniforms, and business-related advertising such as telephone yellow pages, newspapers, and trade journals. Such use shall be accompanied by the words, “Member RSES,” and shall imply no Society endorsement or preference for specific products or services. All other advertising treatments shall be submitted to the Executive Vice President to insure compliance with applicable rules. The Board of Directors may terminate any such license as it deems appropriate.

---

Lost your membership card? We’ll replace it free of charge! Many of the other cards, certificates, diplomas, etc. issued by RSES can be replaced for a nominal fee.

- **Item# 410-012X**
  - Membership card
  - E-mailed
  - No charge

- **Item# 111-001Y**
  - EPA card
  - $15.00

- **Item# 980-005X**
  - Certificate or diploma
  - $10.00

---

The following discontinued items feature the “old” RSES logo. Remainers have been marked down and are available on the RSES Web site at substantial discounts while supplies last. Visit rses.org today and enjoy big savings!

- Nylon jacket
- Men’s dress shirt
- Men’s golf shirt (no pocket)
- Men’s golf shirt (with pocket)
- Women’s dress shirt
- Women’s golf shirt
- RSES logo t-shirt
- RSES logo cap (mesh panels)
- RSES logo cap (solid panels)
- HVACR belt buckle
- RSES logo belt buckle
- RSES logo tie
- RSES bolo tie
- Two-tone professional women’s watch
- Auto emblem
- Auto decal
- Refrigerant truck signs
- Refrigerant usage certification window/truck decal
- We employ certified technicians window/truck decal
- RSES license plate
- RSES license plate frame
- RSES logo embroidered shoulder patch
- RSES logo bullion crest
- CM and CMS stripes
- Refrigerant usage certification patch
- Membership pins
- Identification bars
- Auxiliary pin
- Auxiliary gavel
- Insulated mug
- Pull-apart key chain
- Playing cards
- Cross® pens and pencils
- Folding pocket pointer
- Army-style pocket knife
- Stockman-style pocket knife
- Ten-function pocket knife
- Money clip with tools
Get the tools and publications that you need to operate your Chapter professionally here!

**POLICY & PROCEDURE (P & P) MANUAL***

This manual covers all aspects of Society operations, including fiscal accountability, annual Society awards and scholarships, and more!

**OPERATIONAL POLICY: EDUCATION, TRAINING, AND TESTING***

This document covers all aspects of education and training operations, including SAM, training courses, exam procedures, and the current CEU policy.

**CHAPTER OFFICER’S TRAINING MANUAL**

This manual provides instruction in the procedures, policies, and practices to be used in administering an RSES Chapter.

**THE POCKET GUIDE**

This pocket-sized reference booklet is indispensable for Chapter Officers, Deputy Directors, Regional Executives, or anyone interested in details about RSES. Features include RSES Background, Code of Ethics, Mission Statement, listings of International Officers and Directors, Committees, Regional Deputy Directors, and Chapter Contacts, plus RSES Bylaws, an 18-month planning calendar, procedural summaries (installing officers, etc.), Training Course and exam ordering/conducting procedures, and more.

**RECRUITMENT AND MEMBER RETENTION GUIDE***

Available only as a PDF on the RSES Web site free of charge to Chapter Web Officers, this 26-page guide is packed full of ideas on how to recruit and retain RSES members at the Chapter level.

**MAILING ENVELOPE FOR PROSPECTIVE MAILINGS**

Used for prospective mailings, this two-color, 6-in. x 9-in. envelope ideally holds RSES promotional materials, membership applications, or anything you would like to send to a prospective member.

---

*Available in electronic form on RSES Web site free of charge to Chapter Web Officers.
PLASTIC NAME TAG/ OFFICER NAME BADGE

Identify your Chapter or association officers with handsome name badges. All include the RSES logo and measure 3.5 in. × 1.25 in. in size. Order the total number of badges needed. It is critical that you include all of the officers’ names along with the offices they hold, plus the name of your Chapter or association, in the “Special notes” section of your order form!

MEMBERSHIP APPLICATIONS**

Make sure that you have enough RSES individual and student membership applications on hand when encouraging newcomers to become RSES members during Chapter activities.

PROMOTIONAL MATERIALS**

Promotional materials describing RSES, RSES training programs, and careers in the HVACR industry are available free of charge to Chapters that desire marketing tools.

*Available in electronic form on RSES Web site free of charge to Chapter Web Officers.

**RSES reserves the right to limit the number of items given to a Chapter for promotional activities.
DISPLAY POSTER FOR PROMOTIONAL BROCHURES**†

Display RSES promotional brochures at technical schools, wholesale houses, Chapter meetings, regional conferences, or anywhere individuals may gather and request more information about RSES.

RSES POWERPOINT PRESENTATION*

This PowerPoint presentation was designed for Directors, Chapter officers, and other RSES members wishing to encourage nonmembers to join. Detailing many RSES offerings and the benefits of membership, this presentation is available on CD.

RSES BANNER/LECTERN COVER

Ideal for all levels of Society meetings, this beautiful green lectern cover makes a bold presentation of the RSES name and logo. Silken polyester fabric is silk-screened with two-color logo, ships complete with hanging dowel and decorative tassels.

PLAQUE EMBLEM†

Add a professional touch to your locally engraved plaques without incurring a “setup” fee for the RSES logo! Handsome, heavyweight emblem features gold-plated metal accents and three-color enamel-filled version of the RSES logo. Complete with self-adhesive tape to affix easily to the plaque of your choice.

MISCELLANEOUS CHAPTER FORMS

*Available in electronic form on RSES Web site free of charge to Chapter Web Officers.
**RSES reserves the right to limit the number of items given to a Chapter for promotional activities.
†Logo art on these items subject to change.

*Item# 407-080X . . . . . . . . . . . . . . . . . . . . Price
  $7.00

*Item# 980-002X
  CD . . . . . . . . . . . . . . . . . . . . . . . . . . . No charge

*Item# 980-080X . . . . . . . . . . . . . . . . . . . . Price
  $45.00

*Item# 901-028X
  Member's Record . . . . . . . . . . . . . . . . . . . No charge

*Item# 901-029X
  Cash Receipts . . . . . . . . . . . . . . . . . . . . No charge

*Item# 901-030X
  Cash Disbursements . . . . . . . . . . . . . No charge

*Item# 901-031X
  Remittance Form . . . . . . . . . . . . . . . . . . . No charge

*Item# 901-039X
  Change Notice Form . . . . . . . . . . . . . . . . . No charge

*Item# 901-051X
  Officers Election Report* . . . . . . . . . . . No charge

*Item# 901-059X
  Minutes Form* . . . . . . . . . . . . . . . . . . . . No charge
**INDIVIDUAL MEMBERSHIP APPLICATION**

RSES 1911 Rohlwing Road, Suite A  Rolling Meadows, IL 60008-1397
Phone: 800-297-5660 or 847-297-6464  Fax: 847-297-5038  Web site: www.rses.org

**FOR HEADQUARTERS USE ONLY**

<table>
<thead>
<tr>
<th>MC</th>
<th>Member No.</th>
<th>Chapter No.</th>
<th>BC</th>
</tr>
</thead>
</table>

**PLEASE TYPE OR PRINT CLEARLY** the information you wish to be shown on all RSES records and correspondence.

- Mr.  - Mrs.  - Ms.  - Mr.  - Mrs.  - Ms.

First name ___________________________  MI ______  Last name ___________________________

Home address ___________________________________________  Apt.# __________

City ___________________________________________  State/Province _______  Zip/Postal Code __________

Country ___________________________  Phone ___________________________  Cell ___________________________

Fax ___________________________  E-mail ___________________________

Month/Day/Year of birth ___________________________

RSES member within the last 3 years?  - Yes  - No  
Member No. ___________________________  CM _____  CMS _____

Send mailings to my:  - Home address (above)  - Business address (below)

Please check if you DO NOT wish to receive:  - Press releases, notices, announcements, and other information from RSES and the RSES Educational Foundation via:  - E-mail  - Fax  
Business-related third-party offers via:  - Direct mail  - E-mail  - Fax

Having agreed to abide by the Society Bylaws, and those of any Chapter or subsidiary association to which I may belong, I hereby officially apply for membership in RSES.

Signature ___________________________________________  Date _______________

**EDUCATION/EMPLOYMENT INFORMATION**

<table>
<thead>
<tr>
<th>School Name (most recent)</th>
<th>Years attended</th>
</tr>
</thead>
<tbody>
<tr>
<td>___________________________</td>
<td>_______________</td>
</tr>
</tbody>
</table>

City ___________________________________________  State/Province _______  Area of study ___________________________

Employer Name (current or most recent)_________________________________________

Address ___________________________________________  City ___________________________________________  State/Province _______  Zip/Postal Code __________

Country ___________________________  Phone ___________________________  Alt. Phone _______________________

Fax ___________________________  E-mail ___________________________

**PAYMENT METHOD**

New Member Dues (check one)  - One year: $128.00  - Two years: $230.40  - Three years: $326.40  
(save 10%)  (save 15%)

- Check enclose (make payable to RSES in U.S. dollars)

Credit card  - VISA  - MASTERCARD  - AMERICAN EXPRESS  - DISCOVER

Card No. ___________________________________________  Expiration date _______________

Authorized signature ___________________________________________  CCV

Note: A special *RSES Journal* individual subscription price ($18 per year) is included in membership dues. Members may not deduct the subscription price from dues. To determine if RSES membership dues are tax-deductible, consult your tax advisor.
STUDENT MEMBERSHIP APPLICATION
RSES     1911 Rohlwing Road, Suite A     Rolling Meadows, IL 60008-1397
Phone: 800-297-5660 or 847-297-6464    Fax: 847-297-5038     Web site: www.rses.org

**PAYMENT METHOD**

Student Member Dues: $51.50 per year

- Check enclosed (make payable to RSES in U.S. dollars)

- Credit card: □ VISA □ MASTERCARD □ AMERICAN EXPRESS □ DISCOVER

- Card No. ____________________________ Expiration date _____________

- Authorized signature ____________________________ CCV __________

Student membership includes your choice of free T-shirt or cap!

- T-shirt □ M □ L □ XL □ XXL (circle size)

- Cap □

**Note:** A special *RSES Journal* individual subscription price ($18 per year) is included in membership dues. Members may not deduct the subscription price from dues. To determine if RSES membership dues are tax-deductible, consult your tax advisor.

---

**ANSWERS REQUIRED**

1. **My primary HVAC role is:** (check one)
   - Contractor
   - Service Technician/Installer
   - Operations/Maintenance Manager/Engineer/Technician
   - Engineer
   - Sales
   - Instructor
   - Student
   - Other ______ (please specify)

2. **My firm’s business is:** (check one)
   - Contractor: 1–3 technicians
   - Contractor: 4–10 technicians
   - Contractor: 11–19 technicians
   - Contractor: 20+ technicians
   - HVACR industry OEM
   - Industrial (manufacturing or processing, not HVACR industry)
   - Wholesaler/Distributor
   - Commercial/Institutional/ Government Agency/Association
   - Other ______ (please specify)

3. **I heard about RSES from:** (check one)
   - Seminar
   - Chapter
   - Friend
   - Employer
   - School/Instructor
   - Member (current/former)
   - Direct mail
   - Internet
   - *RSES Journal*
   - Other ______ (please specify)

4. **My e-mail preferences:** (check all that apply)
   - Conference
   - Seminars
   - Regional/Association/Chapter news
   - General news
   - Training and testing news
   - Product news
   - Chapter Officer news
   - *RSES Journal* updates
   - *RSES Journal* news and Web exclusives
   - *RSES Journal* e-newsletters
   - Industry news and events
   - Membership benefits
   - Business-related third-party offers

---

**EDUCATION INFORMATION**

- **School Name ________________________________________________________________________________________**
- **Address ____________________________________________________________________________________________**
- **City __________________________ State/Province ______ Zip/Postal Code __________**
- **Country __________________________ Name of HVACR instructor __________________________________________**
- **Date started ___________ Expected graduation date ____________**

**IMPORTANT NOTE:** Please attach your current course schedule with your application. Both items must be returned to RSES in order for your Student Member application to be processed.

---

**FOR HEADQUARTERS USE ONLY**

<table>
<thead>
<tr>
<th>MC</th>
<th>Member No.</th>
<th>Chapter No.</th>
<th>BC</th>
</tr>
</thead>
</table>

**PLEASE TYPE OR PRINT CLEARLY** the information you wish to be shown on all RSES records and correspondence.

- Mr. □ Mrs. □ Ms.

- First name ____________________________ MI _____ Last name ____________________________

- Home address ____________________________ Apt.# __________

- City ____________________________ State/Province _______ Zip/Postal Code __________

- Country ____________________________ Phone ____________________________ Cell ____________________________

- Fax ____________________________ E-mail ____________________________

- Month/Day/Year of birth ____________

- Having agreed to abide by the Society Bylaws, and those of any Chapter or subsidiary association to which I may belong, I hereby officially apply for membership in RSES.

- Signature ____________________________ Date ____________

---

**PAYMENT METHOD**

- Check enclosed (make payable to RSES in U.S. dollars)

- Credit card: □ VISA □ MASTERCARD □ AMERICAN EXPRESS □ DISCOVER

- Card No. ____________________________ Expiration date _____________

- Authorized signature ____________________________ CCV __________

---

**Important Note:** Please attach your current course schedule with your application. Both items must be returned to RSES in order for your Student Member application to be processed.
# CORPORATE MEMBERSHIP APPLICATION

**1911 Rohlwing Road, Suite A**  
Rolling Meadows, IL 60008-1397  
Phone: 800-297-5660 or 847-297-6464  
Fax: 847-297-5038  
Web site: www.rses.org

---

**FOR HEADQUARTERS USE ONLY**

<table>
<thead>
<tr>
<th>Member No.</th>
<th>Chapter No.</th>
<th>BC</th>
</tr>
</thead>
</table>

**PLEASE OR PRINT CLEARLY**

Name of company  
Street address  
City  
State Province  
Zip/Postal Code  
Country  
Tax ID  
Phone  
Fax  
E-mail  
Web site  
Description of business  

**Please select one of the categories below to determine your annual assessment:**

<table>
<thead>
<tr>
<th>Category</th>
<th>Annual Assessment</th>
<th>Issues Included</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. Manufacturer/Producer</td>
<td>$300.00</td>
<td>3</td>
</tr>
<tr>
<td>B. Power Utility</td>
<td>$250.00</td>
<td>2</td>
</tr>
<tr>
<td>C. Wholesaler/Distributor</td>
<td>$200.00</td>
<td>2</td>
</tr>
<tr>
<td>D. Manufacturer’s Representative</td>
<td>$150.00</td>
<td>1</td>
</tr>
<tr>
<td>E. Training Associate (School, Learning Center, Correctional Facility, etc.)</td>
<td>$200.00</td>
<td>2</td>
</tr>
<tr>
<td>F. Industry Association</td>
<td>$200.00</td>
<td>2</td>
</tr>
</tbody>
</table>

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

**ANSWERS REQUIRED**

1. **My primary HVACR role is:**  
   - [ ] Service Technician/Installer  
   - [ ] Operations/Maintenance Manager/Engineer/Technician  
   - [ ] Engineer  
   - [ ] Sales  
   - [ ] Instructor  
   - [ ] Student  
   - [ ] Other (please specify)  

2. **My firm’s business is:**  
   - [ ] HVACR industry OEM  
   - [ ] Industrial (manufacturing or processing, not HVACR industry)  
   - [ ] Wholesaler/Distributor  
   - [ ] Commercial/Institutional/Government Agency/Association  
   - [ ] Other (please specify)  

3. **I heard about RSES from:**  
   - [ ] Seminar  
   - [ ] Chapter  
   - [ ] Friend  
   - [ ] Employer  
   - [ ] School/Instructor  
   - [ ] Member (current/former)  
   - [ ] Direct mail  
   - [ ] Internet  
   - [ ] RSES Journal  
   - [ ] Other (please specify)  

4. **My e-mail preferences:**  
   - [ ] Conference  
   - [ ] Seminars  
   - [ ] Regional/Association/Chapter news  
   - [ ] General news  
   - [ ] Training and testing news  
   - [ ] Product news  
   - [ ] Chapter Officer news  
   - [ ] RSES Journal updates  
   - [ ] RSES Journal news and Web exclusives  
   - [ ] RSES Journal e-newsletters  
   - [ ] Industry news and events  
   - [ ] Membership benefits  
   - [ ] Business-related third-party offers  

---

**FOR HEADQUARTERS USE ONLY**

**PLEASE RETURN THIS FORM WITH YOUR CHECK (OR USE CREDIT CARD INFO BELOW). THANK YOU!**

- [ ] Check enclosed (make payable to RSES in U.S. dollars)
- [ ] Credit card [ ] VISA [ ] MASTERCARD [ ] AMERICAN EXPRESS [ ] DISCOVER
- Card No. ___________________________ Expiration date ___________________________
- Authorized signature ___________________________ CCV ___________________________
Please type or print clearly the information you wish to be shown on all RSES records and correspondence.

First name ____________________________ MI _____ Last name ___________________________________________

Company name ______________________________________________________________________________________

Home address __________________________________________________________________ Apt.# _______________

City ___________________________________________ State/Province _______ Zip/Postal Code __________________

Country ________________ Phone ___________________________ E-mail ____________________________________

PAYMENT METHOD

☐ Check enclosed (make payable to RSES in U.S. dollars)

Credit card ☐ VISA ☐ MASTERCARD ☐ AMERICAN EXPRESS ☐ DISCOVER

Card No. ___________________________________________ Expiration date ______________

Authorized signature _____________________________________________________________ CCV ______________

RSES JOURNAL

• The preferred source for information on new and applied technology.
• Provides in-depth analysis of important HVACR issues, news, and trends.
• Offers monthly departments and special features such as Manufacturers Service Advisory Council (MSAC) Hotline, Industry News, safety and tech tips, and much more!

RSES JOURNAL PRICING

<table>
<thead>
<tr>
<th></th>
<th>U.S.</th>
<th>Canada</th>
<th>Foreign</th>
</tr>
</thead>
<tbody>
<tr>
<td>One year (12 monthly issues)</td>
<td>$48.00</td>
<td>$66.00</td>
<td>$72.00</td>
</tr>
<tr>
<td>Two years (24 monthly issues)</td>
<td>$84.00</td>
<td>$120.00</td>
<td>$132.00</td>
</tr>
<tr>
<td>Three years (36 monthly issues)</td>
<td>$108.00</td>
<td>$162.00</td>
<td>$180.00</td>
</tr>
</tbody>
</table>

All rates quoted and payable in U.S. dollars.

☐ YES, I would like to subscribe to RSES Journal.

☐ One year (12 monthly issues) ☐ Two years (24 monthly issues) ☐ Three years (36 monthly issues)

☐ YES, send me information about becoming an RSES member.

RSES JOURNAL NEWSLETTERS

• Conference
• Seminars
• Regional/Association/Chapter news
• General news
• Training and testing news
• Product news
• Chapter Officer news
• RSES Journal updates
• RSES Journal news and Web exclusives
• RSES Journal e-newsletters
• Industry news and events
• Membership benefits
• Business-related third-party offers

ANSWERS REQUIRED

1. My primary HVACR role is: (check one)
   ☐ Contractor
   ☐ Service Technician/Installer
   ☐ Operations/Maintenance Manager/Engineer/Technician
   ☐ Engineer
   ☐ Sales
   ☐ Instructor
   ☐ Student
   ☐ Other ____________________________ (please specify)

2. My firm’s business is: (check one)
   ☐ Contractor: 1–3 technicians
   ☐ Contractor: 4–10 technicians
   ☐ Contractor: 11–19 technicians
   ☐ Contractor: 20+ technicians
   ☐ HVACR industry OEM
   ☐ Industrial (manufacturing or processing, not HVACR industry)
   ☐ Wholesaler/Distributor
   ☐ Commercial/Institutional/ Government Agency/Association
   ☐ Other ____________________________ (please specify)

3. I heard about RSES from: (check one)
   ☐ Seminar
   ☐ Chapter
   ☐ Friend
   ☐ Employer
   ☐ School/Instructor
   ☐ Member (current/former)
   ☐ Direct mail
   ☐ Internet
   ☐ RSES Journal
   ☐ Other ____________________________ (please specify)

4. My e-mail preferences: (check all that apply)
   ☐ Conference
   ☐ Seminars
   ☐ Regional/Association/Chapter news
   ☐ General news
   ☐ Training and testing news
   ☐ Product news
   ☐ Chapter Officer news
   ☐ RSES Journal updates
   ☐ RSES Journal news and Web exclusives
   ☐ RSES Journal e-newsletters
   ☐ Industry news and events
   ☐ Membership benefits
   ☐ Business-related third-party offers

Photocopy this form as needed
APPLICATION TO PROCTOR
RSES EXAMINATIONS

PLEASE TYPE OR PRINT CLEARLY the information you wish to be shown on all RSES records and correspondence. Complete all sections.

Examinations you wish to proctor: ☐ EPA Section 608 Certification ☐ Universal R-410A

To be administered on behalf of: ☐ Company ☐ RSES Chapter ☐ School ☐ Other ____________________

GENERAL INFORMATION

Name ☐ Mr. ☐ Mrs. ☐ Ms. __________________________________________________________________

Home address _______________________________________________________________________________________

City ___________________________________________ State/Province _______ Zip/Postal Code __________________

Home phone ___________________________________ Business phone ______________________________________

Cell ___________________________________________ Fax ________________________________________________

E-mail _____________________________________________________________________________________________

RSES AFFILIATION

Are you a member of RSES? ☐ Yes ☐ No

Member No. ___________________________ Chapter No. ______________

Are you a Chapter Officer? ☐ Yes ☐ No If yes, position held ____________________

Is your business a Corporate Member of RSES? ☐ Yes ☐ No Corporate Member No. __________________________

Company name ______________________________________________________________________________________

Company address _____________________________________________________________________________________

City ___________________________________________ State/Province _______ Zip/Postal Code __________________

Company phone _________________________________ Ext. _________ Fax __________________________________

Web site _____________________________________________________________________________________________

AGREEMENT

By submitting this proctor application, I am agreeing to abide by all examination administration rules as set forth by RSES. I agree to keep all exams and exam-related material secured and in my possession until needed for testing. I further understand that no exam material may be reproduced for any reason.

I will notify RSES if there are any changes to my contact information (i.e., address, phone number, e-mail address, etc.). Upon conclusion of the exam session, I agree to ship all examinations and pertinent examination material the next business day, via a trackable shipping method. I further understand that should I fail to uphold any of the examination administration rules, RSES reserves the right to terminate my appointment as a proctor.

Signed ___________________________ Date __________________

ANSWERS REQUIRED

1. My primary HVAC role is:

☐ Contractor
☐ Service Technician/Installer
☐ Operations/Maintenance Manager/Engineer/Technician
☐ Engineer
☐ Sales
☐ Instructor
☐ Student
☐ Other ____________________ (please specify)

2. My firm’s business is:

☐ Contractor: 1–3 technicians
☐ Contractor: 4–10 technicians
☐ Contractor: 11–19 technicians
☐ Contractor: 20+ technicians
☐ HVACR industry OEM
☐ Industrial (manufacturing or processing, not HVACR industry)
☐ Wholesaler/Distributor
☐ Commercial/Institutional/ Government Agency/Association
☐ Other ____________________ (please specify)

3. I heard about RSES from:

☐ Seminar
☐ Chapter
☐ Friend
☐ Employer
☐ School/Instructor
☐ Member (current/former)
☐ Direct mail
☐ Internet
☐ RSES Journal
☐ Other ____________________ (please specify)

NOTE: Please attach a separate sheet detailing your industry experience and any additional information to be considered (awards, certifications, association memberships, etc.).
### EXAMINATION ORDER FORM FOR PROCTORS

**RSES**  
1911 Rohriwing Road, Suite A  
Rolling Meadows, IL 60008-1397  
Phone: 800-297-5660 or 847-297-6464  
Fax: 847-297-5038  
Web site: www.rses.org

---

#### PROCTOR’S RSES AFFILIATION

<table>
<thead>
<tr>
<th>Field</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>RSES member?</td>
<td>[ ] Yes [ ] No</td>
</tr>
<tr>
<td>Member No.</td>
<td></td>
</tr>
<tr>
<td>Chapter No.</td>
<td></td>
</tr>
<tr>
<td>Corporate member?</td>
<td>[ ] Yes [ ] No</td>
</tr>
<tr>
<td>Corporate Member No.</td>
<td></td>
</tr>
<tr>
<td>Company name</td>
<td></td>
</tr>
</tbody>
</table>

#### EXAM INFORMATION

<table>
<thead>
<tr>
<th>Field</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Today’s date</td>
<td></td>
</tr>
<tr>
<td>Exam date</td>
<td></td>
</tr>
</tbody>
</table>

#### EXAM NAME

- **EPA Section 608 Certification**
- **Universal R-410A Safety & Training**
- **Certificate Member (CM)***
- **Active Specialized Member (SM)***
- **Certificate Member Specialist (CMS)***
  - Air Conditioning Specialist
  - Controls Specialist
  - Domestic Service Specialist
  - Dynamic Compression Specialist
  - Heat Pump Specialist
  - Heating Specialist
  - HVACR Electrical Specialist
  - Refrigeration Specialist
- **RSES Technical Institute (TI)****
  - Manual 1—Exam only
  - Manual 2—Exam only
  - Manual 3—Exam only

---

#### PROCTOR’S GENERAL INFORMATION

<table>
<thead>
<tr>
<th>Field</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Name</td>
<td>[ ] Mr. [ ] Mrs. [ ] Ms.</td>
</tr>
<tr>
<td>Address</td>
<td></td>
</tr>
<tr>
<td>City</td>
<td>State/Province</td>
</tr>
<tr>
<td>Zip/Postal Code</td>
<td>Country</td>
</tr>
<tr>
<td>Home phone</td>
<td>Business phone</td>
</tr>
<tr>
<td>Cell</td>
<td>Fax</td>
</tr>
<tr>
<td>E-mail</td>
<td></td>
</tr>
</tbody>
</table>

#### SHIPPING INFORMATION

(If different from above address)

<table>
<thead>
<tr>
<th>Field</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Name</td>
<td></td>
</tr>
<tr>
<td>Address</td>
<td></td>
</tr>
<tr>
<td>City</td>
<td>State/Province</td>
</tr>
<tr>
<td>Zip/Postal Code</td>
<td>Country</td>
</tr>
<tr>
<td>Phone</td>
<td>Fax</td>
</tr>
<tr>
<td>E-mail</td>
<td></td>
</tr>
</tbody>
</table>

### OTHER

**Shipping of Exams:** Exams are shipped only to RSES-approved proctors.  
**Rush fees:** A rush fee will be charged on any Exam order submitted fewer than seven business days in advance of Exam date.  
**Requirements for conducting SM/CM/CMS Exams:** Refer to Operational Policy: Education, Training, and Testing (see page 56) for rules on conducting SM/CM/CMS Exams.

#### THIS SECTION FOR HEADQUARTERS USE ONLY

<table>
<thead>
<tr>
<th>Version</th>
<th>Quantity sent</th>
<th>Version</th>
<th>Quantity sent</th>
</tr>
</thead>
<tbody>
<tr>
<td>145A</td>
<td></td>
<td>146A</td>
<td></td>
</tr>
<tr>
<td>145B</td>
<td></td>
<td>146B</td>
<td></td>
</tr>
<tr>
<td>145C</td>
<td></td>
<td>146C</td>
<td></td>
</tr>
<tr>
<td>145D</td>
<td></td>
<td>146D</td>
<td></td>
</tr>
<tr>
<td>145E</td>
<td></td>
<td>146E</td>
<td></td>
</tr>
</tbody>
</table>

**Total # of Exams shipped**

Date shipped

Shipping method

Shipped by
Preparing for the NATE Exam is a series of training manuals designed to give HVACR service technicians and installers the tools they need to be successful in mastering the key concepts required to pass the NATE certification examinations. Books in the series are written in clear and concise language and illustrated with four-color graphics that clarify important details.

PREPARING FOR THE NATE EXAM:
CORE ESSENTIALS
218 pages

PREPARING FOR THE NATE EXAM:
AIR CONDITIONING AND HEAT PUMPS
200 pages

Contents:
Chapter 1 Soft Skills
Chapter 2 Trade Tools
Chapter 3 Safety
Chapter 4 Heat and Matter
Chapter 5 Electrical Fundamentals
Chapter 6 Transformers and Motors
Chapter 7 Electrical Diagrams
Chapter 8 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

Contents:
Chapter 1 Human Comfort and System Selection
Chapter 2 Heat Transfer and the Basic Refrigeration Cycle
Chapter 3 System Components
Chapter 4 Electrical Components
Chapter 5 Installation Guidelines
Chapter 6 Reading Electrical Schematics
Chapter 7 Troubleshooting Electric Circuits
Chapter 8 System Performance Checks
Appendix A Answers to Review Questions

This CD is a supplement to the Safety for the HVACR Service Technician manual. Created specifically for HVACR instructors and trainers, the 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 of either using the questions as individual end-of-chapter review tests, or combining them into a comprehensive final exam. In addition, the CD provides thorough slide notes to guide HVACR instructors and trainers through the presentation.

Item# 200-105X
Member .................................. $25.00
Corporate member ....................... $25.00
Nonmember .............................. $40.00

NOTE Corresponding print manual is also available. Refer to the “Certification Preparation and Reference Materials” section (see page 36) for more information.

Pricing subject to change. Shipping and handling apply to all orders.
You want to be among the best HVAC professionals in the industry. You know that ongoing training is essential to developing your core technical skills and advancing your industry knowledge. RSES eLearning is the most effective way to accomplish this.

RSES eLearning is high-quality online training developed by leading HVACR experts. Courses are straightforward and include not only learning objectives, but also interactive exercises, audio and animations, and end-of-module assessments with printable certificates upon successful completion.

All eLearning courses are recognized by North American Technician Excellence (NATE), providing technicians with the opportunity to earn continuing education hours (CEHs) and continuing education units (CEUs).

RSES eLearning is high-quality online training developed by leading HVACR experts. Courses are straightforward and include not only learning objectives, but also interactive exercises, audio and animations, and end-of-module assessments with printable certificates upon successful completion.

All eLearning courses are recognized by North American Technician Excellence (NATE), providing technicians with the opportunity to earn continuing education hours (CEHs) and continuing education units (CEUs).

Courses available:
- Air Conditioning Fundamentals
- Electricity for HVACR Technicians
- Safety for the HVACR Technician
- Refrigerant Usage Certification (EPA Section 608)

Purchasing options (see pricing below*):
- RSES eLearning Library. For one low price, you get access to all courses for 12 months, including any new courses that are launched during your subscription period.
- Course. Made up of 6–20 short courses/modules on a related topic, all in one package.

**eLearning features:**
- Chat. Allows you to chat with others who are logged on.
- Study Groups. Allows you to post and respond to Q&A threads and search messages.
- My History. Lists dates of courses that you have started and/or completed, along with test details.
- Course Glossary. Offers an option for searching through course topics using key words.
- My Profile. Gives you the ability to post a profile picture and specify your communication preferences.
- Instant Printable Personalized Certificate. Allows you to print a personalized certificate that recognizes your accomplishment.

<table>
<thead>
<tr>
<th>Content</th>
<th>Standard pricing (nonmember)</th>
<th>RSES member price</th>
</tr>
</thead>
<tbody>
<tr>
<td>RSES eLearning Library (Unlimited access to all courses for 12 months)</td>
<td>$595</td>
<td>$495</td>
</tr>
<tr>
<td>Course (All modules within a specific topic)</td>
<td>$225</td>
<td>$150</td>
</tr>
<tr>
<td>Short course/module (One module)</td>
<td>$60</td>
<td>$40</td>
</tr>
</tbody>
</table>

*Multi-user discounts are also available.

Made possible through the generous support of the

R.W. KELLOW CENTER OF LEARNING

R.W. “Bill” Kellow, CM, was a visionary leader of RSES. During his tenure as president of RSES in 1980–1981, he sought to create a school for HVACR service professionals. Following his death in 1992, a generous contribution sparked numerous donations to the RSES Educational Foundation Center of Learning Fund, and the fund was rechristened in his name in honor of his vision and dedication.

Although a school was never built, RSES embraced the concept of “bringing the classroom to the student” by offering seminars at local RSES chapters nationwide. Now, with the launch of RSES eLearning, Bill’s vision has been expanded further. The classroom can be wherever the student is. HVACR professionals worldwide can now access renowned RSES training anytime, anywhere!
As an employer...the CM and CMS designations mean that you're getting an employee with superior knowledge.

Originated in 1935, the CM designation indicates that an individual has passed a very difficult examination, testing 18 categories of knowledge required in the installation and servicing of refrigeration and air conditioning equipment. Although the examinations require a thorough understanding of the fundamentals of mechanical refrigeration theory, they are written to test the professional's working knowledge of installation, service, and troubleshooting procedures. The CMS designation indicates that an individual has passed one or more of the eight Specialist exams available. Astute contractors, managers, and business owners across the continent recognize the level of competence that CM and CMS designations indicate.

"Kerr Controls feels that it’s very important for our employees to stay current with industry developments. We believe RSES programs provide excellent avenues to accomplish that goal—to the extent that the company not only pays the employees’ annual membership dues, but covers costs for them to attend conferences where CM testing is held. If an employee passes the CM test, we have a $500 bonus for them!"

—Kevin Toomey
Sales Manager
Kerr Controls Limited
Truro, Nova Scotia, Canada

As an employee...in a word, the CM and CMS classifications mean prestige.

RSES Certificate Members and Certificate Member Specialists are among the top service professionals in the entire industry. Only 15% of current RSES members hold the prestigious CM designation, and only 2.5% have achieved CMS status! Current pass rates average 30% for CM, and 20% for CMS.

"People who take the time to study and pass the RSES CM exam really stand out among their peers. Our Engineering Department believes strongly in the value of certification, particularly CM, because it demonstrates a competency level otherwise difficult to gauge. We believe that if you're furthering your education, you're adding to your overall career portfolio, and that can only enhance your employment potential!"

—Roger Ufford, CMS
HVACR Supervisor, Engineering
Memorial Hospital
Chattanooga, TN

Achieving CM and CMS status can have a significant effect on your career. From direct financial incentives to long-term job security, attaining CM and CMS provides your employer with the criteria by which to evaluate and reward your personal commitment to continuing education.

"We award a $500 immediate bonus to employees who pass the CM test. We know that CMs know what they're doing—in fact, if a CM applies for a posted job opening, they're usually hired on the spot! We also feature information about CMs in sales literature for our customers, so that they understand why our technicians are superior to most of the rest of them out there."

—Pat Davis, CM
Brothers Air Conditioning
Carrollton, TX

WHAT DO CM AND CMS MEAN TO YOU?

As an employer...the CM and CMS designations mean that you're getting an employee with superior knowledge.

Originated in 1935, the CM designation indicates that an individual has passed a very difficult examination, testing 18 categories of knowledge required in the installation and servicing of refrigeration and air conditioning equipment. Although the examinations require a thorough understanding of the fundamentals of mechanical refrigeration theory, they are written to test the professional's working knowledge of installation, service, and troubleshooting procedures. The CMS designation indicates that an individual has passed one or more of the eight Specialist exams available. Astute contractors, managers, and business owners across the continent recognize the level of competence that CM and CMS designations indicate.

"Kerr Controls feels that it’s very important for our employees to stay current with industry developments. We believe RSES programs provide excellent avenues to accomplish that goal—to the extent that the company not only pays the employees’ annual membership dues, but covers costs for them to attend conferences where CM testing is held. If an employee passes the CM test, we have a $500 bonus for them!"

—Kevin Toomey
Sales Manager
Kerr Controls Limited
Truro, Nova Scotia, Canada

As an employer...in a word, the CM and CMS classifications mean prestige.

RSES Certificate Members and Certificate Member Specialists are among the top service professionals in the entire industry. Only 15% of current RSES members hold the prestigious CM designation, and only 2.5% have achieved CMS status! Current pass rates average 30% for CM, and 20% for CMS.

"People who take the time to study and pass the RSES CM exam really stand out among their peers. Our Engineering Department believes strongly in the value of certification, particularly CM, because it demonstrates a competency level otherwise difficult to gauge. We believe that if you're furthering your education, you're adding to your overall career portfolio, and that can only enhance your employment potential!"

—Roger Ufford, CMS
HVACR Supervisor, Engineering
Memorial Hospital
Chattanooga, TN

Achieving CM and CMS status can have a significant effect on your career. From direct financial incentives to long-term job security, attaining CM and CMS provides your employer with the criteria by which to evaluate and reward your personal commitment to continuing education.

"We award a $500 immediate bonus to employees who pass the CM test. We know that CMs know what they're doing—in fact, if a CM applies for a posted job opening, they're usually hired on the spot! We also feature information about CMs in sales literature for our customers, so that they understand why our technicians are superior to most of the rest of them out there."

—Pat Davis, CM
Brothers Air Conditioning
Carrollton, TX

WHAT DO CM AND CMS MEAN TO YOU?