2021 HVACR Training Program Guide

Emerson Educational Services

COPELAND™

EMERSON™

About Us

Emerson Educational Services

Educational Services: Technical training is more important than ever. Emerson's Educational Services delivers comprehensive training programs that not only cover essential service skills, they also keep you up-to-date on emerging technology. From hands-on seminars to online tools, Emerson provides the training you need, at a time and place that fits your schedule. Emerson is also a proud supporter of industry associations and certification programs.

Emerson Instructors: Every Emerson Educational Services course is led by an Emerson certified instructor. With exceptionally broad knowledge and understanding of refrigeration principles, technology and the industry as a whole, each of our instructors has extensive hands-on experience, and an innate understanding of the contractor's business, needs and concerns.

Instructor-Led Programs

Classroom and Hands-On Learning

Emerson Educational Services instructor-led seminars take place at locations all around the country, on dates and times designed to have the least impact on the contractor's business.

Every course is taught by an Emerson Certified instructor. The following pages describe each of the instructor-led programs offered by Emerson Educational Services.

Find a Class Near You

Browse course offerings and locations at **Education.Emerson.com**.

Don Gillis

Educational Services Technical Trainer

Don Gillis joined Emerson in July 2017. Don has 25 years of HVAC industry experience including roles as an Installer, Service Technician, Service Manager, Business Owner and Territorial Sales Manager.

Don has served on the Heating Advisory Board for Ivy Tech Community College and has served as guest speaker at HVACR industry events, including the HVACR Educators and Trainers Conference and the RSES Conference and HVACR Technology Expo. Don has also been quoted in national trade magazines and has served as a judge for the SkillsUSA HVACR Championship competition the last two years.

Don attended Vantage Vocational school, the University of Toledo, and Ivy Tech Community College. His industry recognized credentials include being BPI certified, a licensed HVAC Journeyman, a RSES Member as well as having EPA 608 Certifications and OSHA Supervisor Certifications.

Don was born and raised near Sidney, Ohio and has been married to his high school sweetheart for 37 years.

Dustin Tillery

Educational Services Technical Trainer

Dustin Tillery joined Emerson in 2015 and has 25 years of refrigeration industry experience, including extensive work with building and refrigeration control systems.

At Emerson, Dustin has served as Technical Trainer as well as a Technical Support Engineer with Emerson Technical Support Services. Prior to joining Emerson, he spent over 10 years as a refrigeration and AC service technician and 5 years as a technical service advisor for an HVACR wholesaler. Dustin attended Askins Vocational Technology School, receiving a degree in HVACR Technology.

David E. Dunn, C.M.

Educational Services Training Consultant

Dave grew up in Lakeland Florida and graduated from Lakeland Senior High School in 1970. He attended vocational school at the Polk Vocational Technical Center, now L.H. Traviss Center, and while in his junior and senior years he studied Air Conditioning Technology. He spent the next 11 years as a Service Technician repairing and installing all types of residential and light commercial equipment for various contractors.

He then changed his career path and became an outside sales representative for a large air conditioning wholesaler in the Orlando area. He was promoted to management in 1983 and spent the next 30 + years as a salesperson or manager of other locations within the Orlando area. He also spent two years as a Manufacturer's Representative.

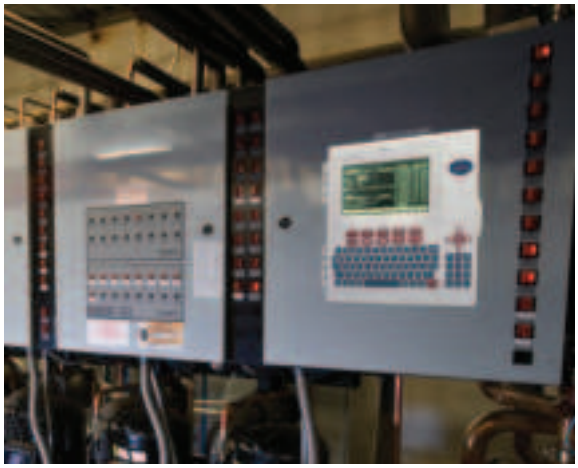
Dave is a member of the Refrigeration Service Engineers Society since 1979 and has achieved their CM Certification, serving as an instructor in various classes the organization has offered.

E2 and Site Supervisor

Instructor Led
Hands-On Training

Program Description

Don't miss this opportunity to gain valuable hands-on experience with the industry's most powerful HVAC/R controllers. This course combines in-depth knowledge with extensive practical training in setting up, servicing and troubleshooting Emerson control systems. This course covers refrigeration, building and convenience store applications. The course work is reinforced with hands-on navigation and exercises on training simulators equipped with working peripherals.



Length

1-day class or 2-day seminar

Learning Outcomes

After attending this course, you'll be able to:

- Identify controller hardware and software.
- Explain correct controller setup.
- Describe the peripherals used with controllers.
- Describe networking and network troubleshooting.
- Navigate the controller interface
- Program controller applications.

Course Agenda

One Day Class

- Hardware and Software
- Controller Setup
- Peripherals
- Networking and Network Troubleshooting
- Controller Navigation
- Understanding Controller Application

Two Day Seminar

- All Topics Covered In One Day Class
- Programming RX Controller Applications
- Programming BX Controller Applications
- Hands-On Exercises to Reinforce Instructor-Led Training

Compressor Operation and Service Seminar

Instructor Led
Hands-On Training

Program Description

This three-day program provides you with an in-depth understanding of compressor design, construction and operation. You'll learn about the latest in Copeland™ compressor technology and applications as well as examine overall system design, field service and troubleshooting. The class includes a valuable failure analysis hands-on tear-down. Results include better customer service, more accurate diagnosis and more effective repairs to eliminate costly callbacks and increase technician productivity.

Length

3 days

Learning Outcomes

After attending this course, you'll be able to:

- Identify the basic components of a refrigeration system and describe their functionality.
- Describe best-practices used in servicing refrigeration systems.
- Define the three conditions of refrigerants.
- Compare the properties of refrigerants.
- Identify the refrigerants and lubricants recommended by Emerson for use with Copeland™ compressors.
- Describe the design, construction and operation of scroll, hermetic, and semi-hermetic compressors.
- Explain compressor motor operation.
- Identify common causes of compressor failure.
- Describe troubleshooting steps that can be taken to avoid compressor failures.
- Demonstrate how to recognize the causes of compressor failures.
- Use Emerson Mobile Apps to locate information and troubleshoot products.

Course Agenda

Day 1

- Good Service Practices
- System Components
- Refrigerants and Oils
- Compressor Fundamentals

Day 2

- Refrigerant-Cooled Compressors
- Reciprocating/Welded Compressors
- Scroll Compressors
- Air-Cooled Compressors

Day 3

- Mechanical Causes
- Teardown and Analysis of Failure
- Corrections
- Motor Applications

CO_2 Refrigeration

Instructor Led
Hands-On Training

Program Description

In this two-day instructor led training session, you'll gain hands-on experience working on a live CO_2 simulator. The class provides participants with an introduction to CO_2 as a refrigerant, reviews basic CO_2 system architecture, and discusses refrigerant regulations and code updates. You'll also review important safety and maintenance procedures related to R-744.

Length

2 days

Learning Outcomes

After attending this course, you'll be able to:

- Understand new terminology related to the use of CO_2 as a refrigerant.
- Properly map a cascade and transcritical booster system.
- Use best practices to service R-744 systems.
- Optimize efficiency in warm ambient environments.
- Recognize advantages of using R-744 in refrigeration.

Course Topics

- Industry Regulations, Trends, and the Role of Natural Refrigerants
- CO_2 as a Refrigerant
- CO_2 (R-744 Refrigerant Safety & Handling
- Key Industrial Trends
- R-744 System Architectures
- Transcritical and Subcritical CO_2 Compressors
- System Components
- Emerson CO_2 Products
- iPro™ High Pressure CO_2 Controller
- Strategies for Warm Ambient Operation
- CO_2 Startup Sequence
- CO_2 Rack Startup
- CO_2 Installation
- Hot Gas Defrost
- CO_2 Maintenance

Simulator Technology Day

Instructor Led
Hands-On Training

Program Description

This full day training course lets you work with a live simulator using a series of mechanical and electrical exercises that often plague refrigeration and air conditioning systems. You will analyze and determine the best course of corrective action and learn best practices to achieve continued efficient system performance. Working one-on-one with an Emerson Certified Instructor ensures that your understanding and training is complete.

Length

1 day

Learning Outcomes

After attending this course, you'll be able to:

- Identify the basic components of a refrigeration system and describe their functionality.
- Describe best-practices used in servicing refrigeration systems.
- Define the three conditions of refrigerants.
- Evaluate system conditions to troubleshoot refrigeration system issues.
- Calculate compression ratios.
- Perform electrical and mechanical service tasks on a refrigeration system.

Course Topics

- Pump Down
- System Evacuation
- Valve Plate Change
- Faulty Capacitor
- Low Charge
- Faulty Evaporator Fan
- Clogged or Restricted Drier
- Refrigerant Leak
- Dirty or Restricted Condenser
- Loose Electrical Connections
- TXV Superheat
- Compressor Failure Change Out
- Adjust Low Pressure Control – CI/CO
- Change Out Low Pressure Control

Fit for the Future: Natural Refrigerants

Instructor Led
Classroom Training

Program Description

This course examines the current global and U.S. refrigerant regulatory landscape and reviews the use of natural refrigerants, including R-290 (propane), R-744 (carbon dioxide) and R-717 (ammonia). In the course, participants learn about the benefits and challenges associated with the use of the refrigerants, system design, and safety and service considerations.

Length

1 day

Learning Outcomes

After attending this course, you'll be able to:

- Describe refrigerant regulations and trends impacting the HVACR industry.
- Describe the history and current use of natural refrigerants in commercial refrigeration.
- Identify safety and handling requirements with CO_2 and R-290.
- Explain the features, benefits and capabilities of Copeland™ CO_2 and R-290 compressors.
- Describe trends in industrial refrigeration, including the use of Ammonia and CO_2.

Course Topics

- Refrigerant Regulations
- Industry Trends
- Natural Refrigerants
- R-290 and R-744 Safety and Handling
- Copeland™ CO_2 and R-290 Compressors
- Service Best Practices

Compressor and System Troubleshooting

Instructor Led
Classroom Training

Program Description

As a service technician, you may often encounter issues that are detrimental to the operations of your customer. This course takes a logical approach to diagnosing 'system issues' and putting long lasting remedies in place. Students will learn best practices, preventative maintenance tips and ways to maximize the system to save energy; saving your customer money.

Length

1 day

Learning Outcomes

After attending this course, you'll be able to:

- Describe the system factors impacting compressor efficiency and performance.
- Calculate compression ratios.
- Diagnose electrical and mechanical issues impacting refrigeration systems.
- Perform troubleshooting tasks to resolve refrigeration system issues.
- Evaluate system conditions to troubleshoot refrigeration system issues.
- Identify common causes of compressor failure.
- Describe troubleshooting steps that can be taken to avoid compressor failures.
- Demonstrate how to recognize the causes of compressor failures.
- Use Emerson Mobile Apps to locate information and troubleshoot products.

Course Topics

- Refrigeration and Compressor Fundamentals
- Compressor Troubleshooting
- Refrigeration System Troubleshooting
- Compressor Electronics

Scroll Compressor Technology

Instructor Led
Classroom Training

Program Description

Whether your application is air conditioning or refrigeration, this course provides a comprehensive overview of scroll compressors and their varying applications, then follows up with proven troubleshooting techniques and practices. Implementing these practices is sure to save your customer maintenance and operational costs.

Length

1 day

Learning Outcomes

After attending this course, you'll be able to:

- Identify the basic components of a refrigeration system and describe their functionality.
- Describe best-practices used in servicing refrigeration systems.
- Evaluate system conditions to troubleshoot refrigeration system issues.
- Identify the refrigerants and lubricants used with Copeland™ scroll compressors.
- Explain the operation of a Copeland scroll compressor.
- Identify common causes of compressor failure.
- Describe troubleshooting steps that can be taken to avoid compressor failures.
- Demonstrate how to recognize the causes of compressor failures.
- Use Emerson Mobile Apps to locate information and troubleshoot products.

Course Topics

- System Fundamentals
- Refrigerants and Oils
- Applicable Environmental Regulations
- Scroll Technology Principles and History
- Scoll Components
- Compressor Failure Modes
- Internal Scroll Safety Controls
- Scroll Compressor Change Out
- AC Scroll Applications
- Refrigeration Scroll Applications
- Digital Technologies
- Copeland™ Two-Step Scroll Applications
- Variable Speed Scroll
- Economized Vapor Injection
- Online Tools and Mobile Apps

Compressor Technologies for Air Conditioning

Instructor Led
Classroom Training

Program Description

This course provides an in-depth look at the technology used in today's residential and commercial air conditioning systems. During the course, participants will examine the ways regulation, efficiency requirements and customer comfort needs are impacting the technology used in HVAC systems and learn about compressor capacity modulation strategies used to meet these demands. Participants will learn about the design and operation of Emerson system components, including Copeland™ scroll compressors and compressor electronics technology (formerly CoreSense). The course also reviews HVAC system troubleshooting and provides participants with resources they can use on-the-job to gather information and solve problems as well as resources they can share with customers.

Length

1 day

Learning Outcomes

After attending this course, you'll be able to:

- Describe how regulation and efficiency requirements are impacting HVAC systems.
- Describe the benefits of high efficiency equipment.
- Identify the features and benefits of Copeland scroll compressors.
- Explain the design and operation of Copeland scroll compressors.
- Describe the benefits of compressor capacity modulation.
- Compare compressor modulation methods.
- Identify opportunities for applying capacity modulation strategies.
- Describe the functionality and operation of Emerson AC system components.
- Troubleshoot common AC system issues.
- Explain how compressor electronics technology is used to gather information and troubleshoot AC systems.
- Diagnose and troubleshoot system issues using compressor electronics technology and the HVACR Fault Finder mobile app.
- Use Emerson mobile apps and online tools to gather information and troubleshoot products

Course Topics

- Understanding the AC Cycle
- Compressor Technologies
- Scroll Components
- Internal Scroll Safety Controls
- AC Scroll Applications and System Accessories
- Copeland™ Two-Stage Scroll
- Variable Speed Scroll
- Digital Technologies
- Compressor Failure Modes
- Online Tools and Mobile Applications

Residential Scroll

Instructor Led
Classroom Training

Program Description

Scroll technology has revolutionized the HVAC/R industry with energy efficient systems. This course will provide you with the knowledge you need to be proficient - and successful - with this advanced technology. Proper scroll service techniques and practices are presented clearly and with valuable insights into how to apply them efficiently in the real-world service environment. Scroll compressor training also covers new refrigerant technologies, proven troubleshooting techniques and practices, and today's advanced systems technology which enables communication and coordination among various system components.

Length

Half-day (5 hours)

Learning Outcomes

After attending this course, you'll be able to:

- Explain the air conditioning cycle.
- Recall best service practices for residential air conditioning.
- Identify the refrigerants and lubricants used with Copeland™ scroll compressors.
- Explain the operation of a Copeland scroll compressor.
- Explain modulation strategies used in residential air conditioning and their benefits.
- Describe compressor electronics available for use with Copeland scroll compressors and the benefits associated with their use.
- Locate resources you can use when servicing residential AC systems and discussing systems with your customers.

Course Topics

- System Fundamentals
- Refrigerants and Oils
- Applicable Environmental Regulations
- Scroll Technology Principles and History
- Scoll Components
- Scroll vs. Reciprocating Design
- Compressor Failure Modes
- Internal Scroll Safety Controls
- Scroll Compressor Change Out
- AC Scroll Applications
- Digital Technologies
- Copeland™ Two-Stage Scroll Applications
- Variable Speed Scroll
- Online Tools and Mobile Apps

Copeland™ Technical Specialist

Certification

Program Description

The Copeland Technical Specialist (CTS) program establishes Copeland product experts within wholesale branches to improve customer service and strengthen customer relationships.

To learn more about participating in the Copeland Technical Specialist program contact us at **ColdChain.EducationalServices@Emerson.com** or **800.748.2779**.

Online Learning

Emerson Learning Portal

Learn at Your Own Pace

To be more productive in the HVAC/R industry, ongoing training is essential – but taking the time to train in a classroom can be difficult.

Emerson Educational Services makes training easy and convenient with a full library of distance learning courses that you can take anywhere and anytime. Choose from an extensive range of courses that reflect the most current and relevant information for today's HVACR professional.

Learning Topics

Emerson Educational Services offers self-paced learning solutions on a wide range of foundational, industry related topics such as refrigeration systems, components and refrigerants. Additionally, training is available on the Emerson related topics below.

- **Copeland**™ compressors and condensing units
- **Lumity**™ facility controls and electronics
- **Dixell**™ electronics
- **Cooper-Atkins**™ temperature management products and wireless monitoring solutions
- **Emerson**™ valves, controls, and system protectors

Learning Management

The Emerson Learning Portal provides you with the ability to register for learning events, complete self-paced programs, and track your progress.

Registered learners also receive communication via the Learning Portal on new programs and information available from Emerson Educational Services.

To learn more visit **Education.Emerson.com**

About Emerson

Emerson (NYSE: EMR), headquartered in St. Louis, Missouri (USA), is a global technology and engineering company providing innovative solutions for customers in industrial, commercial, and residential markets. Our Emerson Automation Solutions business helps process, hybrid, and discrete manufacturers maximize production, protect personnel and the environment while optimizing their energy and operating costs. Our Emerson Commercial and Residential Solutions business helps ensure human comfort and health, protect food quality and safety, advance energy efficiency, and create sustainable infrastructure. For more information visit **Emerson.com**.

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