



Natural Refrigerant Training Summit

Building a Sustainable Technician Workforce

■ November 14 - 16, 2023 | St. Louis, MO



NORTH AMERICAN

Sustainable Refrigeration Council

Thank you for joining us at our second Natural Refrigerant Training Summit!

This event is part of our larger workforce development program, which focuses on improving technician recruitment, training, and retention to grow the workforce and address the critical shortage of refrigeration technicians.

A key pillar of the program is to increase training opportunities and prepare technicians for the transition to climate-friendly refrigerants. We hope this event provides convenient, comprehensive, and relevant training to ensure your ongoing success today and in the future.

For more information about our workforce development initiative, visit nasrc.org/workforce-development.



The North American Sustainable Refrigeration Council (NASRC) is a 501(c)(3) environmental nonprofit working to advance climate-friendly natural refrigerants and reduce greenhouse gas emissions caused by traditional HFC refrigerants. We collaborate with stakeholders from across the industry, including over 55,000 food retail locations, to eliminate the barriers to natural refrigerants in supermarkets.


Thank you to our generous co-host

From all of us at NASRC, thank you to our co-host, Plumbers and Pipefitters Local 562, for providing their facility for the event.



Plumbers and Pipefitters Local 562 comprises 4,500 members serving the plumbing and mechanical industry in 67 counties in Eastern Missouri. Their membership offers a wide array of plumbing and mechanical skills that are valued throughout the construction industry. They work daily through the employment of our signatory contractors to provide consumers and the public with the region's safest, most highly trained, productive workforce. For more information, visit local562.org and follow them on Facebook and X (@STLlocal562) and Instagram (@stl_local_562).

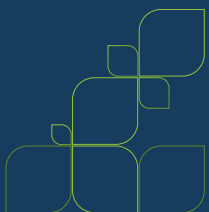
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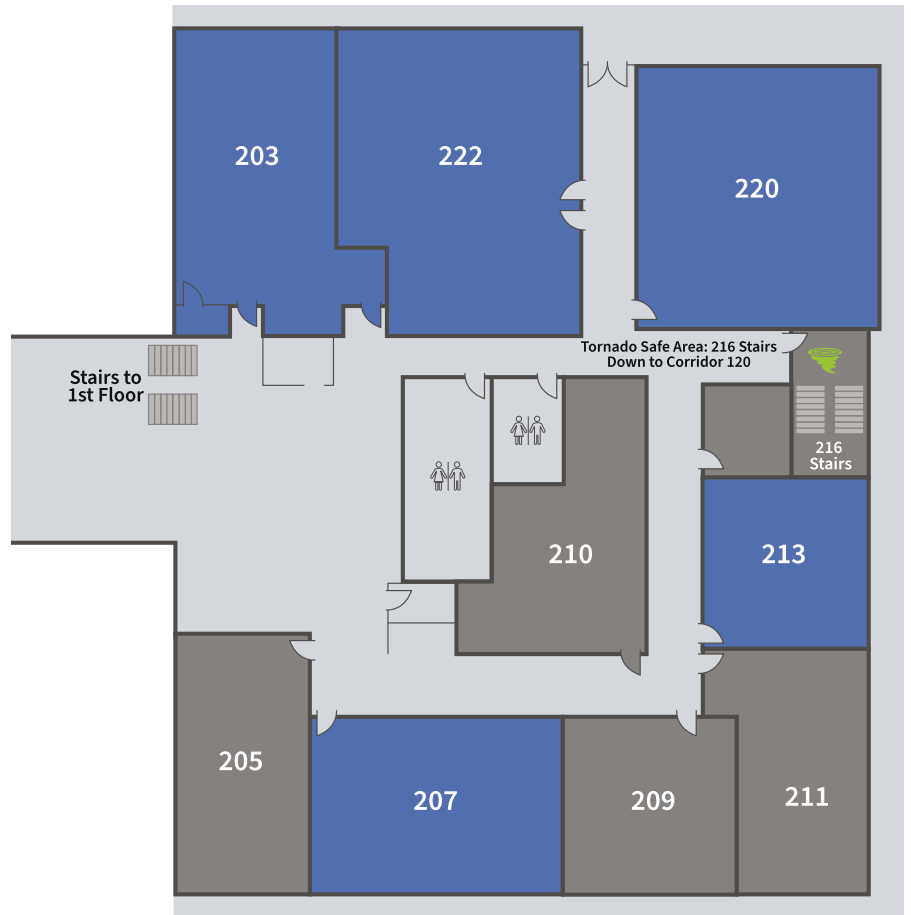
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**Training Center
1st Floor**



**Training Center
2nd Floor**



Scan the QR code to see the exhibit map



Tuesday, November 14th

Start	End	Training Provider	Session Title	Level	Topic	Room
6:30 AM	7:30 AM		REGISTRATION & BREAKFAST			Expo Hall
		Hillphoenix	Understanding Booster Oil Systems	1	CO2	104
		Danfoss*	CO2 Transcritical Systems and Controls	2	CO2	142
		Copeland*	Piping & Instrumentation Diagram (P&ID) for CO2 Transcritical Booster Systems with Live Demo	1	CO2	122/123
7:30 AM	9:00 AM	BITZER	Using BITZER BEST Software with CO2 Compressors	1	CO2	121
		CAREL	Introduction to CO2 Rack Control	1	CO2	213
		Parker Sporlan	CO2 Component Overview with S3C Case Control Introduction	1	CO2	220
		True Manufacturing	Safe Use of R-290 and Good Refrigeration Practices	1	Propane	207
		Kysor Warren	An Introduction to CO2 System Designs	1	CO2	222
9:00 AM	9:30 AM		BREAK			Expo Hall
		Hussmann	CO2 Transcritical Operation	1	CO2	104
		Danfoss*	CO2 Transcritical Systems and Controls	2	CO2	142
		Copeland*	Top 10 Differences Between HFC & CO2 Transcritical Booster Systems with On-Site CO2 System Demo	1	CO2	122/123
9:30 AM	11:00 AM	DORIN	CO2 Transcritical Compressors: Design, Lab Testing, and Troubleshooting	1	CO2	121
		CAREL	Introduction to CAREL Valves and Their Control	1	CO2	213
		Parker Sporlan	Micro Thermo Alliance	2	CO2	220
		AHT	R290 Overview of Micro Distributed Systems & Plug-In Units	1	Propane	207
		Kysor Warren	CO2 Installation, Maintenance, and Troubleshooting	2	CO2	222
11:00 AM	12:00 PM		LUNCH & EXHIBIT HALL			Expo Hall
		Hillphoenix	Understanding and Troubleshooting the High Pressure Control Valve and Flash Gas Bypass Valve	1	CO2	104
		Danfoss*	CO2 Transcritical Systems and Controls	2	CO2	142
		Copeland*	E3 Supervisory Controls with CO2 Applications & New CC200 Case Control	2	CO2	122/123
		BITZER	Using BITZER BEST Software with CO2 Compressors	1	CO2	121
12:00 PM	1:30 PM	RMS	Next Generation Compliance for Next Generation Regulations	ALL	Regulations	213
		Parker Sporlan	CO2 Component Overview with S3C Case Control Introduction	1	CO2	220
		True Manufacturing	Safe Use of R-290 and Good Refrigeration Practices	1	Propane	207
		Kysor Warren	An Introduction to CO2 System Designs	1	CO2	222
1:30 PM	2:00 PM		BREAK			Expo Hall
		Hussmann	CO2 Evacuation, Charging, and Start-up Procedures	2	CO2	104
		RMS	Next Generation Compliance for Next Generation Regulations	ALL	Regulations	142
		Copeland*	Piping & Instrumentation Diagram (P&ID) for CO2 Transcritical Booster Systems with Live Demo	1	CO2	122/123
2:00 PM	3:30 PM	DORIN	CO2 Transcritical Compressors: Design, Lab Testing, and Troubleshooting	1	CO2	121
		CAREL	Introduction to CO2 Rack Control	1	CO2	213
		Parker Sporlan	Micro Thermo Alliance	2	CO2	220
		AHT	R290 Overview of Micro Distributed Systems & Plug-In Units	1	Propane	207
		Kysor Warren	CO2 Installation, Maintenance, and Troubleshooting	2	CO2	222
3:30 PM	5:00 PM		EXHIBIT HALL - INDUSTRY NETWORKING SESSION			Expo Hall

* Mobile training unit available

Level 1 = Little-to-no expertise on session topic

Level 2 = Some prior training and limited field experience on session topic

ALL = All levels / No prior training needed

Wednesday, November 15th

Start	End	Training Provider	Session Title	Level	Topic	Room
7:00 AM	7:30 AM		REGISTRATION & BREAKFAST			Expo Hall
		Kysor Warren	An Introduction to CO2 System Designs	1	CO2	104
		Danfoss*	CO2 Transcritical Systems and Controls	2	CO2	142
		Copeland*	Piping & Instrumentation Diagram (P&ID) for CO2 Transcritical Booster Systems with Live Demo	1	CO2	122/123
7:30 AM	9:00 AM	DORIN	CO2 Transcritical Compressors: Design, Lab Testing, and Troubleshooting	1	CO2	121
		CAREL	Introduction to CAREL Valves and Their Control	1	CO2	213
		Parker Sporlan	CO2 Component Overview with S3C Case Control Introduction	1	CO2	220
		AHT	R290 Overview of Micro Distributed Systems & Plug-In Units	1	Propane	207
		Zero Zone	CO2 Transcritical Systems: Focus on High Pressure Expansion Valve Operation	1	CO2	222
9:00 AM	9:30 AM		BREAK			Expo Hall
		Hillphoenix	Understanding Booster Oil Systems	1	CO2	104
		Danfoss*	CO2 Transcritical Systems and Controls	2	CO2	142
		Copeland*	Top 10 Differences Between HFC & CO2 Transcritical Booster Systems with On-Site CO2 System Demo	1	CO2	122/123
9:30 AM	11:00 AM	BITZER	Using BITZER BEST Software with CO2 Compressors	1	CO2	121
		CAREL	Introduction to CO2 Rack Control	1	CO2	213
		Parker Sporlan	Micro Thermo Alliance	2	CO2	220
		True Manufacturing	Safe Use of R-290 and Good Refrigeration Practices	1	Propane	207
		Hussmann	CO2 Transcritical Operation	1	CO2	222
11:00 AM	12:00 PM		LUNCH & EXHIBIT HALL			Expo Hall
		Kysor Warren	CO2 Installation, Maintenance, and Troubleshooting	2	CO2	104
		RMS	Next Generation Compliance for Next Generation Regulations	ALL	CO2	142
		Copeland*	E3 Supervisory Controls with CO2 Applications & New CC200 Case Control	2	CO2	122/123
12:00 PM	1:30 PM	DORIN	CO2 Transcritical Compressors: Design, Lab Testing, and Troubleshooting	1	CO2	121
		CAREL	Introduction to CAREL Valves and Their Control	1	Regulations	213
		Parker Sporlan	CO2 Component Overview with S3C Case Control Introduction	1	CO2	220
		AHT	R290 Overview of Micro Distributed Systems & Plug-In Units	1	Propane	207
		Zero Zone	CO2 Transcritical Systems: Focus on High Pressure Expansion Valve Operation	1	CO2	222
1:30 PM	2:00 PM		BREAK			Expo Hall
		Hillphoenix	Understanding and Troubleshooting the High Pressure Control Valve and Flash Gas Bypass Valve	1	CO2	104
		Danfoss*	CO2 Transcritical Systems and Controls	2	CO2	142
		Copeland*	Top 10 Differences Between HFC & CO2 Transcritical Booster Systems with On-Site CO2 System Demo	1	CO2	122/123
2:00 PM	3:30 PM	BITZER	Using BITZER BEST Software with CO2 Compressors	1	CO2	121
		RMS	Next Generation Compliance for Next Generation Regulations	ALL	Regulations	213
		Parker Sporlan	Micro Thermo Alliance	2	CO2	220
		True Manufacturing	Safe Use of R-290 and Good Refrigeration Practices	1	Propane	207
		Hussmann	CO2 Evacuation, Charging, and Start-up Procedures	2	CO2	222
3:30 PM	6:00 PM		EXHIBIT HALL - HVACR STUDENT & FACULTY NETWORKING SESSION			Expo Hall

* Mobile training unit available

Level 1 = Little-to-no expertise on session topic

Level 2 = Some prior training and limited field experience on session topic

ALL = All levels / No prior training needed

Thursday, November 16th

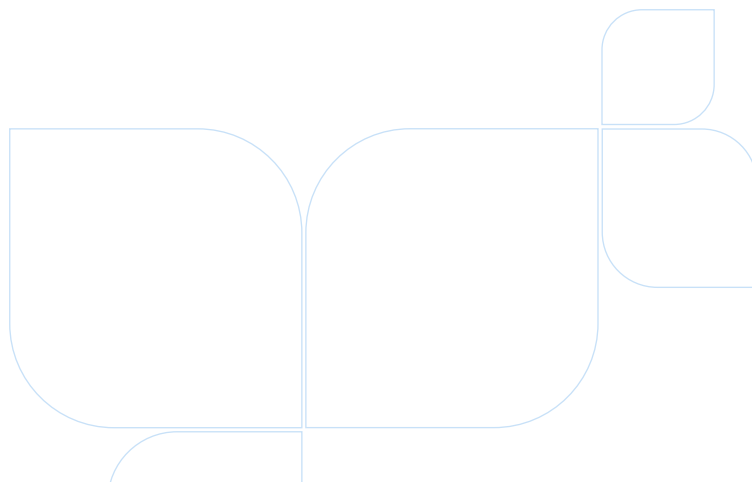
Start	End	Training Provider	Session Title	Level	Topic	Room
7:00 AM	7:30 AM		REGISTRATION & BREAKFAST			Expo Hall
		Hillphoenix	Understanding Booster Oil Systems	1	CO2	104
		Kysor Warren	An Introduction to CO2 System Designs	1	CO2	142
		Copeland*	CO2 Climate Study, TCO Study, ESG Goals, and Controls Transition Plans for Food Retailers	ALL	CO2	122/123
7:30 AM	9:00 AM	BITZER	Using BITZER BEST Software with CO2 Compressors	1	CO2	121
		CAREL	Introduction to CO2 Rack Control	1	CO2	213
		Hussmann	CO2 Transcritical Operation	1	CO2	220
		True Manufacturing	Safe Use of R-290 and Good Refrigeration Practices	1	Propane	207
		Zero Zone	CO2 Transcritical Systems: Focus on High Pressure Expansion Valve Operation	1	CO2	222
9:00 AM	9:30 AM		BREAK			Expo Hall
		Kysor Warren	CO2 Installation, Maintenance, and Troubleshooting	2	CO2	104
		Danfoss*	CO2 Transcritical Systems and Controls	2	CO2	142
		Hussmann	CO2 Evacuation, Charging, and Start-up Procedures	2	CO2	122/123
9:30 AM	11:00 AM	DORIN	CO2 Transcritical Compressors: Design, Lab Testing, and Troubleshooting	1	CO2	121
		Parker Sporlan	CO2 Component Overview with S3C Case Control Introduction	1	CO2	220
		AHT	R290 Overview of Micro Distributed Systems & Plug-In Units	1	Propane	207
		RMS	Not Just Another Presentation on Regulations	ALL	Regulations	222
11:00 AM	12:00 PM		LUNCH & EXHIBIT HALL			Expo Hall
		Hillphoenix	Debunking CO2 Myths	ALL	CO2	104
		Danfoss*	CO2 Transcritical Systems and Controls	2	CO2	142
		Copeland*	Piping & Instrumentation Diagram (P&ID) for CO2 Transcritical Booster Systems with Live Demo	1	CO2	122/123
12:00 PM	1:30 PM	RMS	Not Just Another Presentation on Regulations	ALL	Regulations	121
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Session Descriptions

AHT Cooling Systems USA: R-290 Overview Including Micro Distributed Systems & Plug-In Units

Overview of 290 history and usage and design as well as installation and service of R-290 micro distributed systems and controls. Review service, maintenance, troubleshooting, and controls of R-290 plug in units.

Trainers: Clay Galloway and Jurgen Freidl

Topic: Propane (R-290) **Level 1**

BITZER US: Using BITZER BEST Software with CO2 Compressors

This training will explain how the BITZER BEST Software can be used to get a deeper understanding of how the compressor is operating. The session will also cover options and accessories associated with the IQ module and CO2 compressors. Topics to be covered range from minimum requirement and basic functionality to troubleshooting.

Trainer: Miguel Boscan **Topic:** CO2 (R-744) **Level 1**

Copeland*: Piping & Instrumentation Diagram (P&ID) for CO2 Transcritical Booster Systems with Live Demo

The exercise will familiarize students with the piping layout of a CO2 Transcritical booster system. The instructor will review and explain each system component, map flow direction, its purpose, how it compares to a similar component used in an HFC systems. Each major component shown on P&ID will also have an accompanying photo and demonstration from a CO2 TCB System operating on site. After class students will be able physically see the mobile training unit with P&ID in hand for reference.

Trainer: Andre Patenaude **Topic:** CO2 (R-744) **Level 1**

Copeland*: Top 10 Differences Between HFC & CO2 Transcritical Booster Systems with On-Site CO2 System Demo

The course will cover the ten key design consideration between CO2 and HFC systems, from secondary to cascade with emphasis on transcritical booster systems. The instructor will cover gas cooler types and will review subcritical and transcritical modes of operation. High pressure concerns, pressure reliefs, where they occur and how standstill pressures are mitigated during the off cycle. The class will also cover critical and triple point of CO2 as well as importance of effectively managing high pressure and bypass gas valves to achieve system stability.

Trainer: Alain Mongrain **Topic:** CO2 (R-744) **Level 1**

CAREL USA: Introduction to CO2 Rack Control

This training session will provide a basic overview of the CAREL CO2 rack controller; the pR300T. We will explain the basics of the interface as well as basic setup and parameter configurations of the pR300T. We will cover the importance of proper installation and how installation directly impacts controller operation.

Trainer: Chris Butler **Topic:** CO2 (R-744) **Level 1**

CAREL USA: Introduction to CAREL Valves and Their Control

This training session will provide an introduction to CAREL valves, stators, and control methods. This includes the operation, installation, application, and servicing of CAREL valves. Additionally, we will cover the installation, operation, and servicing of CAREL valve drivers and how these interact with a CO2 refrigeration system.

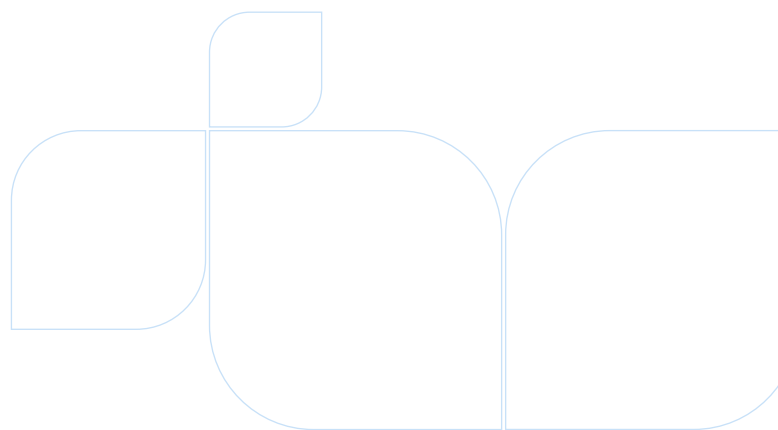
Trainer: Chris Butler **Topic:** CO2 (R-744) **Level 1**

Copeland*: E3 Supervisory Controls w/ CO2 Applications & New CC200 Case Control

The course will provide an overview of the new E3 supervisory control with native CO2 applications vs E2. The instructor will highlight the specific CO2 features that simplify start-up and troubleshooting. The student will learn about the simplified set up & flexibility with the new CC200 case control & how both E3 & CC200 can leverage the use of our new intuitive HMI via tablet, laptop, or mobile phone.

Trainer: Mike Hill **Topic:** CO2 (R-744) **Level 2**

** Mobile training unit available*



Session Descriptions

Copeland*: CO2 Climate Study, TCO Study, ESG Goals, and Controls Transition Plans for Food Retailers

Copeland's CO2 Climate Study was conducted by a third party engineering firm to highlight the energy saving benefits of the most common high ambient strategies across 13 US climate zones and 166 Cities. The total cost of ownership study (TCO) compares eight architectures to a baseline R-448A centralized vs. CO2, R-290 micro distributed and several others. The ESG information will show review Copeland's commitment to science-based target to achieving Net-Zero and help retailers with their emission reduction targets. In the last section, we will review an effective way of building a Controls transition plan in your food retail operation.

Trainers: Andre Patenaude & Mike Hill

Topic: CO2 (R-744) **ALL Levels**

Hillphoenix: Understanding Booster Oil Systems

This training will help field service technicians better understand how the Booster oil systems work so they can troubleshoot Booster oil issues. What type of oil are we using and some of the most frequent oil alarms and how to resolve them. We will also discuss preventive maintenance and discuss how and how often to perform our oil PM.

Trainer: Rusty Walker **Topic:** CO2 (R-744) **Level 1**

Hillphoenix: Understanding and Troubleshooting the High Pressure Control Valve and Flash Gas Bypass Valve

This training will explain how the high-pressure control valve and flash gas bypass valve operates and is controlled per specs. We will discuss how to troubleshoot the HPCV, FGBV and the controller if and when we have issues at 2:00am.

Trainer: Rusty Walker **Topic:** CO2 (R-744) **Level 1**

Danfoss*: CO2 Transcritical Systems and Controls

The Danfoss training will include covering carbon dioxide properties to include standard transcritical booster systems, EEVs, and parallel compressor systems. The use of Multi Ejector Solutions in various applications.

Trainer: Steve Moss **Topic:** CO2 (R-744) **Level 2**

DORIN USA: CO2 Transcritical Compressors: Design, Lab Testing, and Troubleshooting

The training review important design criteria that must be considered for a transcritical CO2 compressor, with highlights on the many challenges CO2 imposes from a compressor perspective. We will describe our accelerated life testing, showing rigorous laboratory qualification and acceptance criteria. Finally, we will go over troubleshooting for common issues that may occur with CO2 compressors in the field.

Trainer: Nabih Hussein **Topic:** CO2 (R-744) **Level 1**

Hillphoenix: Debunking CO2 Myths

This training will review some of the biggest myths about CO2 servicing and maintenance. We will debunk these myths and learn the correct approach to optimize and successfully operate CO2 Transcritical Booster systems. This training is open to retailers and technicians.

Trainer: Rusty Walker **Topic:** CO2 (R-744) **ALL Levels**

Hussmann: CO2 Transcritical Operation

Training will cover why CO2 is being adopted, how CO2 systems differ from traditional refrigerants and how traditional limitations are being overcome.

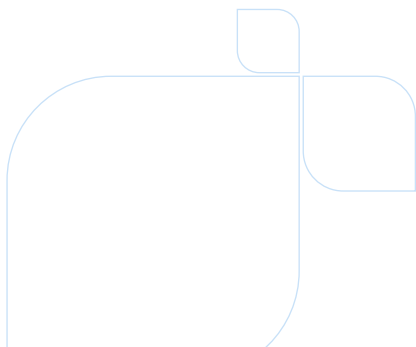
Trainer: John Bento **Topic:** CO2 (R-744) **Level 1**

Hussmann: CO2 Evacuation, Charging, and Start-up Procedures

Overview of a transcritical CO2 system with emphasis on evacuation, charging and start-up procedures. More technical session for those who have a basic transcritical knowledge. Bring your questions!

Trainer: John Bento **Topic:** CO2 (R-744) **Level 2**

** Mobile training unit available*



Session Descriptions

Kysor Warren Epta US: An Introduction to CO2 System Designs

This course is designed to teach basic concepts of CO2 systems, different technologies available to improve refrigeration system efficiency. This course covers, basic principles, safety & CO2 system design.

Trainer: Ignacio Chaparro **Topic:** CO2 (R-744) **Level 1**

Kysor Warren Epta US: CO2 Installation, Maintenance, and Troubleshooting

This course is designed to teach basic concepts of CO2 systems, different technologies available to improve system efficiency, systems installation, start-up, maintenance, and troubleshooting. This course covers, display cases setup, basic rack installation & operation, maintenance, and troubleshooting.

Trainer: Dale Sizemore **Topic:** CO2 (R-744) **Level 2**

Refrigerant Management Solutions (RMS): Next Generation Compliance for Next Generation Regulations

Many retailers rely on their service contractors and technicians to keep them in compliance with federal and state refrigerant regulations. Federal regulations have changed multiple times in the past 5 years, and there are new regulations coming out this year and next year. Oh, and new states are joining the mix every year. Have you kept up? If not, you're not just creating liability for your customers, you're also missing out on a business-building opportunity.

Trainer: Keilly Witman **Topic:** Regulations **ALL Levels**

Refrigerant Management Solutions (RMS): Not Just Another Presentation on Regulations

Is the goal of your refrigerant compliance program to keep you in compliance? If so, you're missing the point. Food retail end-users are chasing their tails trying to find compliance issues and fix them. What they should really be doing is preventing compliance issues in the first place. The EPA declared in August that enforcement of the Aim Act is one of their top priority areas. Are you ready? Are you sure? Really?

Trainer: Keilly Witman **Topic:** Regulations **ALL Levels**

Parker Sporlan: CO2 Component Overview with S3C Case Control Introduction

This course will introduce the concept of refrigeration with an overview of CO2 systems. The course will review CO2 system components including the Gas Cooler/Flash Gas Bypass Valves, Electric Expansion Valves, solenoid valves, ball valves and more. The course will also showcase the S3C Case Control as it performs as an integral part of the system to control evaporator temperature with the ability to remotely monitor and troubleshoot system conditions.

Trainer: Jim Jansen **Topic:** CO2 (R-744) **Level 1**

Parker Sporlan: Micro Thermo Alliance

This course will provide a detailed overview of the Micro Thermo Alliance system. With a wide base of CO2 installs, the instructor will focus on MT Alliance's control schemes, data interpretation and troubleshooting.

Trainer: Adam Hughes **Topic:** CO2 (R-744) **Level 2**

True Manufacturing: Safe Use of R-290 and Good Refrigeration Practices

This course will cover the benefits of R-290 as well as safety labeling, tools to use, and the different parts used in a R-290 units.

Trainer: Rich Boedeker **Topic:** Propane (R-290) **Level 1**

Zero Zone: CO2 Transcritical Systems: Focus on High Pressure Expansion Valve Operation

In our training, we'll have a brief overview of the transcritical CO2 system/properties, describe operation of the high-pressure expansion valve using the pressure enthalpy diagram, review various system architectures and discuss operator safety.

Trainer: Bruce Hierlmeier **Topic:** CO2 (R-744) **Level 1**

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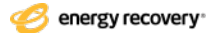
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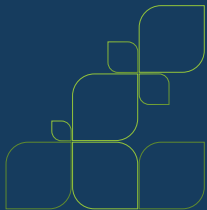
True

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