

# HIGH-PERFORMANCE HVAC TODAY™

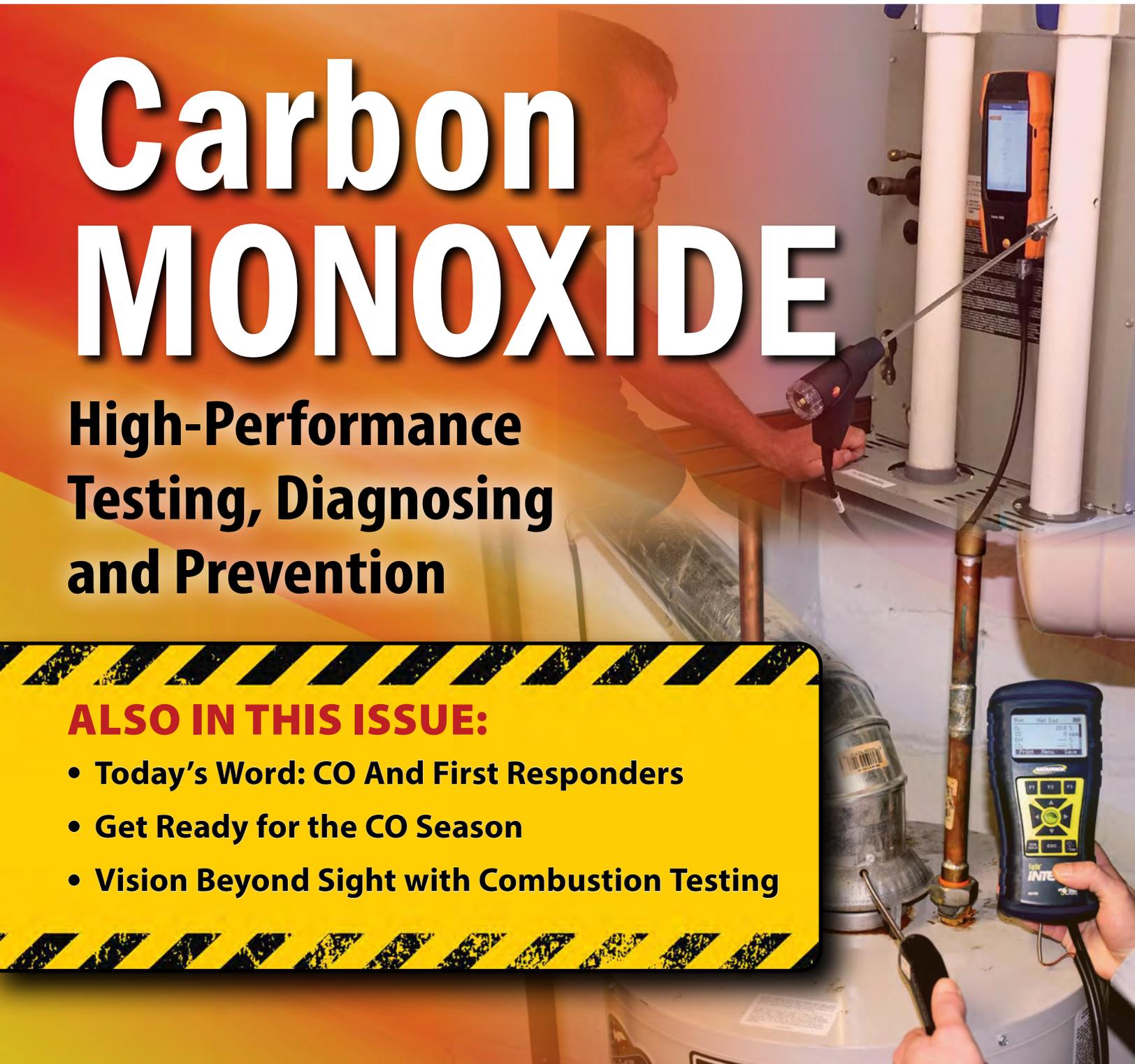
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## **ALSO IN THIS ISSUE:**

- Today's Word: CO And First Responders
- Get Ready for the CO Season
- Vision Beyond Sight with Combustion Testing



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# HIGH-PERFORMANCE HVAC TODAY™



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# CO Season: Working with Local First Responders



**Mike Weil** is editor-in-chief and director of communications and publications at National Comfort Institute, Inc. Contact him at [ncilink.com/ContactMe](https://ncilink.com/ContactMe).

**T**he theme of this issue focuses on carbon monoxide (CO) safety. With Fall soon upon us, dropping temperatures outside mean furnaces and boilers are heating up inside, putting homeowners and first responders at a higher risk for CO poisoning.

According to the U.S. Centers for Disease Control and Prevention (CDC), there are more than 50,000 people in the U.S. hospitalized each year for CO poisoning, and at least 430 people die from it. Yet many first responders (fire departments, Emergency Medical Services, and police) often mistake CO poisoning for the flu, or food poisoning, or other ailments with similar symptoms.

Though the training of emergency responders is not the responsibility of the HVAC Industry, as members of your communities, it is in the best interest of your customers and your team to reach out to local fire departments, EMS personnel, and police to talk about the importance of CO safety.

Many High-Performance HVAC contractors already have procedures for when their techs enter a home. Many technicians carry personal low-level CO monitors and include combustion testing as part of their maintenance/service process.

Last October, National Comfort Institute's David Richardson wrote an article about what the HVAC Industry could learn from the [Texas CO crisis](#) of that year. In that article, he discussed why it's so important for you to promote CO Safety and education to your customers.

What about promoting your expertise to your local first responders as well? Developing a relationship with them can help your community while at the same time promote the high-performance approach to HVAC.

While there are plenty of first responder training programs on how to deal with CO, not every local fire department, EMS team, and police

department is fully trained and up-to-speed on what to do in emergencies. In those cases, you could be the expert they turn to for help finding the cause of the issue and resolving it.

You could even work with first responders on which low-level personal CO monitors to use, why certain low-level monitors for customers are better than store-bought CO detectors, and what the monitor readings mean.

Below are recommendations from the CDC on what first responders should do during a CO emergency. Many trained and certified HVAC contractors already do many of these things:

**Interview the Occupants:** Talk to the occupants and look for symptoms of CO exposure. Ask about possible sources of combustion.

**Measure for Carbon Monoxide:** We have entire articles on this subject. Here is a recent one from Jim Davis: [ncilink.com/COGuess](https://ncilink.com/COGuess).

**Inspect Venting Systems:** Check all chimneys and all other appliance venting systems for leaks, cracks, holes, and blockages.

**Check Carbon Monoxide Alarm Location and Serviceability:** Again, this is geared to first responders.

Several steps may be beyond a first responder's capability and training. This is where you, the trained and certified High-Performance HVAC contractor, can help. Imagine how many lives can be saved and injuries avoided by working together.

You can help bridge the communication gap between the public and our industry when you look out for your customer's best interests by working with first responders.

The CDC says, "Treat every carbon monoxide call like your life depends on it – because it does."

With the Fall CO season coming, does it make sense to reach out to your local first responders? You might sleep better if you do. 



Written by HVAC Professionals for HVAC Professionals

## Elite RHVAC Manual J Software

To provide the right comfort solution, you need a basis of design for new HVAC installations and retrofits. Manual J is a building science-related engineering calculation that evaluates a structure's ability to resist the loss and gain of heat in specific climate conditions.

The information you input describes the structure's thermal envelope, such as window energy efficiency, insulation values, orientation of the house, etc., and the output is measured as the Btuh load of the house.

I've been running load calculations since 1993. There are several excellent software choices available to do this right. Elite RHVAC is the tool I use most

for Manual J, D, and S calculations.

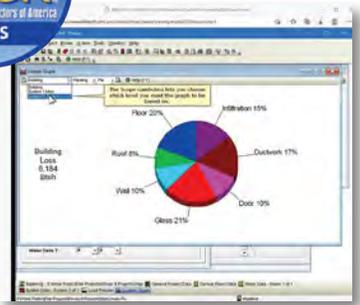
The software you choose should be affordable, user-friendly, accurate, and well supported. RHVAC rates well in all these categories.

Get started learning any room-by-room load calculation software by attending a live or online training seminar. Sign up for training today. You will be glad you did.

Elite's lifetime tech support is easy to access with no additional annual fees. Purchase is a one-time fee for the desktop version with no yearly fees. The basic version includes a Manual S equipment selection calculator that is easy to use.

You can calculate a load using the simple data entry method or purchase **Drawing Board**, which produces CAD drawings and enables you to layout

your duct design by buying the Manual D Ductsize module.



RHVAC incorporates an RPER form that consolidates all the information typically required by Code officials for permits. For more software product information, go to [elitesoft.com](http://elitesoft.com).

The **Manual J Design Studio** ([manualjdesign.com](http://manualjdesign.com)) provides a nationwide residential HVAC system design service. They also train contractors on how to make sense out of Manual J, D, and S. Training is available in person or through online webinars. **NCI**

— by Paul Wieboldt, National Comfort Institute Instructor

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# FieldEdge: Success is Powered by Training

In the late 1970s, HVAC contractors George and Glenn Slay struggled to find ways to automate their company's business and field service sides. These were the early days of the computerization of the HVAC Industry, and for the Slay brothers, there just wasn't anything available that they felt would work for them.

So, they took matters into their own hands and designed their own software. It was based on an operating system called Theos. It worked so well that they decided it would be great to provide this software to other HVAC contractors around the country.

In 1980 they founded an organization called Coastal Computer Corp. in Fort Meyers, FL. Coastal's software became the first package to provide an electronic dispatch board. Eventually the software was integrated with the Quickbooks® accounting system.

Over the next 42 years, Coastal Computer grew and evolved. Twenty-six years ago, it was completely updated and redesigned and became ESC – a Windows-based platform. Since then, the company has integrated with numerous partners, created its own accounting system, and built a tight integration with six other accounting systems.

After years of development, evolution, and changes, today this software is now known as **FieldEdge by Xplor** and services more than 40,000 users across many industries.

Eric Rausin joined the company in the mid-1990s after retiring from a career with the U.S. Navy, where he focused on leadership and inventory management.

Today he serves as vice-president of research and development.

“One of the things that attracted me to this company was their desire for innovation and unending learning. They had great customers, incredible co-workers, and provided me opportunities to grow and advance,” Rausin explains.

## WHAT IS FIELDEDGE?

According to Rausin, FieldEdge is designed to be the nerve center for an HVAC contracting business. It handles customer management, dispatching, invoicing, estimating, service agreements, and item tracking. He says it also has real-time integration with both **QuickBooks Desktop** and **QuickBooks Online**, and can be used in the United States and Canada.

FieldEdge also includes other integrations to help contractors manage payments, GPS tracking, flat rate pricing, marketing, and more.

“Our secret sauce,” Rausin says, “is that we started as an HVAC company.

The Slay brothers understood the contracting business and took the time to learn how other contractors operate and what issues they face by sitting with them. They translated everything they learned into the software.

“This is something we haven't stopped doing over the past 42 years. And now we have a global presence with the resources and financial capabilities to keep us going strong for a very long time.”

What Rausin is talking about is FieldEdge becoming part of **Xplor Technologies** in 2021. Xplor is an international full-service, integrated payment solutions, and business management software provider.

In recent news, Xplor recently finalized the acquisition of **Enterprise Selling Solutions, LLC** (ESS) and its platform, **HVACBizPro**, to help HVAC contractors improve their sales process.

With this acquisition, FieldEdge has a new professional proposal feature, Proposal Pro, based on ESS' digital tools. A press release states, “Designed to help HVAC businesses grow, the acquisition will bring real-time equipment pricing to technicians in the field and office, and live AHRI data to the FieldEdge platform.”

Rausin adds, “As new technologies develop, we will take advantage of them. We want to make it easy for people to do business with us and help them process payments easily.



Eric Rausin, Vice President, Research and Development, FieldEdge

“I love that we are connected to subsidiary companies that have their own incredibly talented engineers. We can use some of the pieces they’re developing, allowing FieldEdge to develop things faster and better. That means some really neat things are coming out in the near future.”

### POWERED BY TRAINING

Another aspect of FieldEdge software Rausin points out is that it is also a teaching tool.

“It allows us to record phone calls, then go back and listen to those so we can see what happened on calls where something went wrong. Then our team can sit down with the contractor’s CSR

and/or dispatcher to figure out what happened and then do some coaching on what they can do differently to improve.

“The idea is it helps our customers be more successful,” he says. “And that is why I believe FieldEdge is a nice match with National Comfort Institute. We have the same mission: to help contractors get better. To do that requires training. I believe that success is powered by training.”

Rausin explains that from his perspective, many contractors started as field technicians who decided to start their own companies. He says most didn’t know that running a business requires an entirely different toolset than fixing equipment.

“In becoming businessmen, they need help through training and tools that make it easier to manage the com-



pany. The more education we can provide on using our software, the less painful the process is, and the faster they will begin benefiting from it,” he continues.

### FIELDEDGE ACADEMY

When contractors first buy the software, Rausin says the FieldEdge team sits down with them and takes the time to help them learn it.

“That’s great during the initial roll-out, but unfortunately, when a contractor later hires someone, they often don’t take the same time to train them. They are busy. They want something easy. Something they can look at and get the answers they need when it’s convenient for them.

“So, we faced this reality and developed good quality training that’s continually updated and accessed over

the Internet. We call it FieldEdge Academy. This software continuously morphs and changes over time. So does the help content. This way, contractors can get the information they need to do their job.

“We try to do this training in small chunks not to overwhelm the tech, who doesn’t want to spend two hours on a Saturday or first thing in the morning learning software. We have dedicated trainers and customer success managers who do ad hoc training on the fly and can also set up a dedicated training.”

Rausin also says that the company is adding a new part to the Academy that focuses on best practices. He says it’s not FieldEdge specific but more focused on how to be a successful contractor.

“We are covering things contractors

The FieldEdge team takes their solutions on the road to show contractors the advantages of their software.



didn't necessarily learn growing up in the contracting industry," he adds.

### THE NCI CONNECTION

In Rausin's view, partnering with NCI makes a lot of sense. He says the FieldEdge approach aligns with NCI's motto, "If You Don't Measure, You're Just Guessing™." He explains that the software helps contractors track and measure all the different aspects of running a field service business.

"Our mission is to educate, improve, and help contractors be more successful. The more educated contractors can be, the more pain and time they can save themselves. Plus, they can save a lot of effort and get much better results.

"For me, one of the most frustrating things is watching people struggle. The technical training that NCI provides helps technicians and contractors become craftsmen by helping them develop the skills necessary to solve customer problems and succeed in business.

"I liken that to the importance of *doing it right the first time*. You can learn by trial and error, but that is a painful way to learn. I resonate with the craftsman mentality; many of our contractor customers have it. I also think the craftsman mentality spreads down to the technician level.

"For these and many other reasons, FieldEdge has partnered with NCI. We've been partners for some years but only recently formed a dedicated team that will now work hand-in-hand with NCI and their members to establish, grow, and maintain a fruitful and rewarding relationship for all involved."

Rausin says their goal is to enhance that relationship and make it much

better for everyone involved, especially NCI members. "We're proud to be a partner that can help members build their NCI Bucks which can be used for valuable training and take their business to the next level, time and time again."

### A MAGIC WAND?

One of Rausin's pet peeves is that the HVAC Industry struggles with inventory management on every level for whatever reason. He says, "if there were a magic wand I could wave and improve the industry, it would be this: better, easier inventory control. Having a good inventory system is more complicated than it should be.

"In today's retail world, inventory is getting so simple. For example, I visited a brick-and-mortar store recently with no checkout lines. You walk the aisles, put the items you want in a basket, and leave.

"The technology in the store tracks your purchases and bills your credit card! Eventually, I'd like to see that happening in the HVAC Industry.

"I think it's a huge step because right now, inventory is an expensive problem to solve. However, as in the example I just cited, a lot of exciting technology is coming down the pipe that could make this easier to manage and control. That is my magic wand wish."

Furthermore, Rausin says he believes it is essential for service and installation technicians to key in on doing their jobs well.

"They need to take pride and ownership of their creativity and craft," he

says. "That means committing to continuous education and training.

"The grass isn't greener on the other side of the fence either. Someone will sometimes try to lure your techs away for \$0.50 more per hour. Once upon a time, that was enough to lose good techs.

"Technicians should remember that a slight increase in pay doesn't matter nearly as much as the people they work with, the integrity of the company they work for, and the pride they have in their knowledge and skills.

"As a tech, if you do find yourself working for a company that doesn't have high integrity, remember there are other companies out there that DO have that integrity. They are worth finding and working for. This is how you will improve your livelihoods and create your future."

The **High-Performance HVAC Today** and **National Comfort Institute** team congratulate Eric Rausin and the **FieldEdge** team on being named the September 2022 *Partner Spotlight*.

If you'd like to learn more about FieldEdge and take advantage of their Training Incentive Partnership Program with NCI, log into the member page at [ncilink.com/FE-TIPP](http://ncilink.com/FE-TIPP).

If you have any questions, you can contact Tracy Kellogg at [TKellogg@fieldedge.com](mailto:TKellogg@fieldedge.com). 

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# Vision Beyond Sight With Combustion Testing

**F**or decades the HVAC industry has been chasing technological advances in a quest to develop an appliance that operates efficiently and safely with an increasing life span. In many cases, manufacturers are driven in this quest by ever-tightening regulations and requirements in efficiency and carbon footprint. At the same time, the industry has not been a great steward to HVAC contractors who must install and startup this equipment in locations that greatly vary from the laboratories where they were developed.

Many of the installation instructions provided for HVAC equipment leave a lot to be desired as far as critical information that would allow to properly install said equipment, analyze, and adjust it for the most optimum and efficient operation. Over the years, this situation as well as other compounding issues leave furnaces operating poorly and inefficiently. Unfortunately, in many cases, this leads to a shorter equipment life span than intended by the manufacturer.

## A DANGEROUS SITUATION

During the last nine years working for National Comfort Institute (NCI), I have facilitated utility training in Southern California. One component of the training is field coaching with technicians from the training classes. During this

time, it became clear that incomplete start-up practices, and a faulty mindset and information led to dangerous equipment operational conditions for the occupants of the homes we test.

**SADLY, THERE IS LITTLE INFORMATION AVAILABLE ON GAS ADJUSTMENTS AND COMBUSTION TO ENABLE TECHNICIANS TO MAKE NEEDED ADJUSTMENTS FOR SAFE OPERATION.**

Recently, a technician with whom I spent some time in the field called to ask if I found a lot of high-limit switches failing. He said he found quite a few.

I explained that safety switch failures most likely were due to furnace overheating and cycling on the high limit, or causing it to trip frequently, or fail. He indicated that in the past he “solved” the issue by replacing the high limit or by increasing the temperature range of the

## The SENSORCON Industrial Pro Personal CO Monitor



The Industrial Pro is a programmable monitor that allows you to set your own alarms as low as 5 ppm and a high set point of 500 ppm. It vibrates, has visual lights, and audible tones to alert you of dangerous CO conditions.



safety switch. These are temporary fixes at best.

After spending more time in the field with him and teaching him [how to analyze the furnace](#) to find the problem, he became more confident and looked beyond the symptoms and simple band-aid fixes.

Over the last several years the situation worsened with the introduction of Ultra Low NOx furnace requirements in many of the climate zones within California.

Furthermore, many manufacturers also feel the pain because of field system design, function, and installation issues that lead to equipment recalls, service bulletins, and parts replacement recalls. In some cases, these solutions call for no more than speeding up the inducer motor to increase flue temperature which lowers the output Btus. The idea is to reduce the fire box temperatures to keep the unit from overheating or worse: melting the coil or catching fire.

Sadly, there is little information available on gas adjustments and combustion to enable technicians to make needed adjustments for safe operation.

Some of the newer Low-NOx equipment is being equipped with a gas

valve with a warranty sticker on the adjustment screw cap that states, "Warranty is void if removed. DO NOT ADJUST."

All they want you to look at is incoming gas pressure.

For our industry to combat and conquer the issues we face with combustion issues is to change the **culture, information, and training** that is available to contractors. Changing culture means changing the [MINDSET](#), [TOOLSET](#), and [SKILLSET](#) of our industry's service providers.



### **MINDSET**

To change the industry mindset, we must begin by addressing the top myths about combustion. Here are several to think about:

- A manifold pressure of 3.5-in. w.c. gas pressure is how to assess and

tune a natural gas furnace

- A manifold pressure of 10-in. w.c. gas pressure is how to assess and tune a propane furnace
- The color of the flame is how you tune a burner
- Passive combustion air is automatic, and the small vents **will** bring in the proper amount of combustion air
- The function of a flue is to vent combustion gases and create draft
- Attention to vent piping is **not as critical** with newer equipment
- Rust in gas appliances is from condensation or chemicals from within the space or home
- White powder in the burner area is a calcium build-up or from chemicals within the space
- Heat exchangers crack due to long use or poor manufacturing materials
- GAMA tables are computer generated tables that tell us everything we need to know about venting
- They are accepted by American Gas Association Labs as an appropriate engineering **methodology** of determining venting requirements.

**The truths about combustion include the following:**

- 3.5- and 10-in. w.c. represent pressure potential and is the amount of force, **not flow**

- The color of the flame tells us very little about the efficiency of combustion
- **Passive means takes no action.** Instead, they let things happen to them. Passive combustion air allows Mother Nature and other influences to do what they want with combustion air
- The flue is a pathway and is nothing more than a duct to provide a path for flue gases to flow
- Attention to the vent piping is even more critical on higher efficiency furnaces and greatly impacts performance and the life of the equipment
- Draft is established by indoor and outdoor pressure and temperature differences and imbalances can interrupt and effect draft.

**Abnormal combustion conditions include the following:**

- Rust is an indicator of **flue gas spillage**. Carbonic acid in the flue gas contacts metal surfaces and begins to create rust and corrosion and can lead to chassis issues and possible carbon monoxide (CO) leakage
- White powder is formed as the carbonic acid in flue gas comes in

## A Good Combustion Analyzer



There are many quality Combustion analyzers available today that do the following:

- Continuously monitors flue gases
- Should measure from 1 ppm to at least 2000 ppm
- Monitors and displays Oxygen percentage
- Measures flue and ambient temperatures for proper assessment.

contact with a surface and then dries

- Cracked heat exchangers are not normal. They occur because of excessive heat that causes metal to expand and contract beyond its design considerations and limits. Common causes are excessive fuel and or low airflow across the heat exchanger. In some cases, these units were cycling on the high limit switch or worse, the limit was replaced or tampered with just to keep the unit running.

**Regarding GAMA Tables, here are more truths:**

- Computer programs are no more

than **code** that instructs a computer, application, or software on how to perform without predetermined assumptions and do not consider many obstacles installed or encountered in the field

- A **methodology** is merely “a contextual framework” that does not provide solutions for given situations. GAMA Tables are not based on any actual field tests or conditions.

**TOOLSET**

Changing the **mindset** includes education of the true dangers and precautions of combustion. **Toolset** begins with personal safety and awareness of your surroundings when working on combustion appliances. Having a personal CO monitor is the best way to assure that you and your customers remain safe when installing, testing, and repairing these appliances.

For many years I worked in large machine and boiler rooms and never was told the importance of monitoring your work surroundings. The scary thing is many of us have been exposed to high levels of CO many times. We were not aware of the real reason why we had a headache or an afternoon of nausea and slight dizziness. We

## The Dwyer 460 Air Meter



The Dwyer 460 air meter is recognized as the industry standard for draft measurement and has been around for decades. It allows for quick and valuable flue draft information.

- Measures to .01-in. of water column
- Measures flue draft
- Confirms that there is available combustion air in the room.

assumed the cause was from something else like not eating a good lunch, or being too tired etc.

Changing the toolset just begins with personal safety. It forces us to look beyond the classic approaches to service and installation by acquiring the proper tools and instruments to properly test, assess, and adjust for proper combustion. This begins with a simple draft gauge and a quality combustion analyzer.

Not having or not using a draft gauge leaves you blind to the effects of the flue and whether it is even venting properly. A draft gauge is a **MUST** for performing detailed combustion testing. Yet it is not referenced at all in installation instructions, or suggested or mentioned by any manufacturer tech support people.

There are many conversations on what is important to monitor and measure on combustion appliances. Some combustion analyzers also monitor NOx and other gases. This is terrific if you need to know gas levels, but they don't have a direct correlation to proper and efficient combustion. Keep in mind that CO, O2, flue gas temperature, and flue draft are more important indicators for diagnosis.

Changing your Mindset and Toolset is not enough. The last element needed is the expertise and knowledge. Even with the best instruments, technicians often guess or follow misleading guidance from individuals who really don't understand proper combustion diagnostics and don't understand what the analyzer is trying to tell them.

### SKILLSET

Technicians without the proper skillset are left alone in the field when

they encounter combustion issues. They don't know where to install test ports, what the readings on the analyzer mean, or what the little white ball lifting in the draft gauge means.

**THE SCARY THING IS MANY OF US HAVE BEEN EXPOSED TO HIGH LEVELS OF CO AND WERE NOT AWARE OF THE REAL REASON WHY WE HAD A HEADACHE OR AN AFTER-NOON OF NAUSEA AND SLIGHT DIZZINESS.**

This leads to incorrect assumptions in the field where they end up addressing the symptom, but not the problem or safety issue.

Skillset is that final factor that enables your team to deliver the value and safety your customers deserve. Skillset is achieved through training,

education, and experience.

Only a well-rounded service professional who has the proper mindset, toolset and skillset can expect to have a chance to provide the truest value and safety that customers deserve. If your team has only one or two of these elements, they will still fall short of what we, as an industry, need to do to truly make appliances operate as designed.

In the current climate culture with many states engaging in decarbonization and electrification programs, the combustion appliances that remain when the programs are completed need to be operating as efficiently as possible with as minimal carbon impact as possible.

Mindset, toolset, and skillset provide you and your field service and installation teams vision beyond sight when it comes to testing, diagnosing, and solving combustion issues. 

## Jeff Sturgeon Presented at NCI Summit 2022



This article is based on a presentation given by Jeff Sturgeon at National Comfort Institute's **2022 High-Performance HVAC Summit** in Scottsdale, AZ. The Practitioner session was titled, *"Vision Beyond Sight with Combustion Testing: Give Your Customers the Value They Deserve."*

In this session, Jeff showed High-Performance HVAC contractors how the right knowledge and test instruments can give you X-Ray vision during combustion testing to help you find hidden defects.

If you couldn't attend this year's Summit, this article should give you the key highlights of what Jeff shared with those who were there.

By the way, be sure to mark your calendars for the **2023 Summit which will be held in Branson, MO from April 16-20, 2023.**

**Jeff Sturgeon** is NCI's Southern California Training Center Manager/Instructor. You can reach him at [ncilink.com/ContactMe](https://ncilink.com/ContactMe) with any questions.





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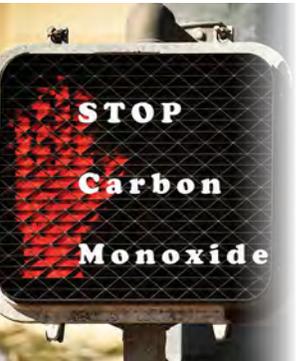
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# Getting Ready for the Carbon Monoxide Season



**W**hen it comes to gas-fired equipment service and repair, it is always incumbent upon HVAC contractors to be aware of, trained in, and ready to resolve potential combustion issues that can lead to carbon monoxide (CO) problems in your customer's homes.

At [T.E. Spall & Son](#), we are always preparing our team of 30 service and installation technicians on CO safety. However, we ramp up our focus on combustion analysis and CO safety through T.E. Spall University (our in-house training program) in August and September as we head into the heating season.

I like to call that “sharpening the ax.”

I believe that as a professional in the HVAC industry and a perceived expert in the consumer's eye, we have a responsibility to know and understand these concepts to ensure the health and safety of the homes and families we serve.

I TAKE THIS EXTREMELY SERIOUSLY.

## IT ALL STARTS WITH TRAINING

Being prepared to handle any CO situations we encounter isn't something that just happens. It takes planning and training. Long ago, we invested in building our own training facilities. We use them to keep our team current in the basics of [combustion and CO safety](#) and on the latest system testing, airflow testing and diagnostics, and solutions.

We do regular in-house training as well as bring in National Comfort Institute (NCI) every two years to recertify our field team.

We have been certified as high as 100% throughout our 19 years of training in the High-Performance HVAC method with NCI. We are currently about 30% trained with an upcoming NCI class in

our training facility.

The T.E. Spall University facilities include a fundamentals lab, a “live-fire lab,” plus a classroom with a Smart TV. We use this space every week — typically three to four training days per week. We do both live and virtual meetings from there.

The live-fire lab has newer modern equipment, including two basic HVAC systems, a geothermal system, a combi-boiler system, and an inverter system.

In addition to technical training, we also ensure our dispatchers and front office people know how to handle emergency calls regarding a potential CO issue. We typically provide them training and awareness via our weekly service department meetings.

We instruct our customer service representatives (CSRs) to inform customers whose CO detectors or monitors are going off to open the windows, exit the house, and call 911 if necessary. Then we send a service technician to assess the situation.

Our local fire department will recommend us in many instances when CO alarms go off for inconclusive reasons, according to their findings.

## THE IMPORTANCE OF PROCESS

Another thing we do is make sure our team follows the processes and guidelines that we've set up. We've made combustion analysis testing part of every maintenance and demand service call. Plus, our managers meet with the service and installation teams each week to discuss any CO encounters from the past seven days and discuss best practices used during those events.

Furthermore, we include combustion testing and analysis as part of our service agreement program. We currently have 1,600 service agreement

customers. It is also important to note that training on our processes is continuous.

Developing and working on such processes is all part of a significant cultural change we began making at T.E. Spall years ago. It started with learning about the High-Performance HVAC contracting method from NCI and continues through regular training and practicing it daily.

Part of our process is knowing how to use the right instruments for the job. For combustion testing, we primarily use Bacharach Insight analyzers. We issue one to every service technician and lead installer. Another part of the process is that all our field personnel use the analyzer as a personal protection device, zeroed outside and then brought into the home.

The bottom line is that as contractors, we don't know what we don't know. All of us in the industry who work on combustion appliances are responsible for educating ourselves to ensure the safety and health of our customers and our team. This is not an option for me!

### THE NEED TO COMMUNICATE

Another aspect of getting ready for the CO season is to let your community know you offer these services. At T.E. Spall, we do this through marketing and advertising using traditional print media, some television, and radio campaigns, and sometimes we use billboards around town.

Social media is another way we try to reach customers and explain the importance of getting their systems checked regularly.

Another part of what we do to protect our customers is to give them



access to top-of-the-line CO monitors. We are an NSI 6000 reseller for NCI, and we include information about these monitors and what makes them different than store-bought detectors on every service and maintenance call. We promote their use through all of our customer communication channels as well.

### BEING PREPARED SAVES LIVES

Late Fall one year, one of our customers' store-bought UL CO detectors went off, and she called the fire department. They came out to her house and could find nothing wrong, so they recommended she contact us to identify the problem. The woman was a new mother with a five-day-old daughter.

When our technician arrived on the scene, he immediately performed combustion testing and determined that a steam boiler with improper venting was the issue.

As we know, typical UL detectors can see up to 70 ppm of CO for up to four hours before alarming occupants. This is extremely dangerous for any newborn baby who doesn't yet have a fully developed immune system.

We red-tagged the appliance and provided an estimate for repairs, which we couldn't do until the following day. However, we provided the customer with a low-level CO

monitor for the evening to protect her and the baby (and would allow me to sleep that night).

Our team returned to the house the next day and performed draft modifications and final testing.

This could have been an awful situation. I have had many stories like this in my 19 years of practicing the principles that NCI teaches.

If you don't already do combustion testing and CO safety training, I advise you to get started. Attend an NCI training event, adopt the procedures they teach, and train your people. A fish stinks from the head down: as your company's leader, you need to be fully onboard, or any efforts to be prepared for CO situations are doomed to fail.

I am forever grateful for the knowledge I've gained through my training experiences. It has helped our company and me to rise above the mediocrity of the world around us. 



**Tom Spall** is the owner of Carbondale, PA-Based T.E. Spall and Son, a 38-year-old HVAC and plumbing company with a gross sales volume of \$6 million. He's been a member of NCI since 2003 and is a strong proponent of High-Performance HVAC contracting. He can be reached at [ncilink.com/ContactMe](https://ncilink.com/ContactMe).



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4665 Lampson Ave, Ste. 110A • Los Alamitos, CA 90720  
[ncilink.com/AdvAirSCE](http://ncilink.com/AdvAirSCE)

#### SHEFFIELD LAKE, OH

**DATES:** October 31 - November 4, 2022

**TIME:** 8:00 a.m. - 5:00 p.m.

**LOCATION:** NCI Training Center  
4270 Lake Road • Sheffield Lake, OH 44054  
[ncilink.com/AdvAir](http://ncilink.com/AdvAir)

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## NCI Welcomes Five New Members

Membership in National Comfort Institute (NCI) is a step toward becoming a High-Performance HVAC Contracting firm. It is a commitment that has an extraordinary impact on your business and team.

So, it is our pleasure to recognize and welcome those new members who joined our ranks since May 1, 2022:

- 24 EVCS LLC, Denver, CO
- Accuraters, Burbank, CA
- Benny's Heating and Air Conditioning, Elgin, IL
- Joseph Hart, Inc., Pilesgrove, NJ
- Reliance Energy Services, Riverside, CA.

The entire NCI team is pleased you have decided to join our family and look forward to meeting and working with all of you. Welcome!!!

## Online University For Your Customer Service

Customer Service is at the heart of every HVAC contractor's business. **Proactive** customer service simply means being in control of conditions instead of just reacting to them.

In this National Comfort Institute (NCI) online training course, "Proactive Customer Service 101," you'll learn about the

importance of a company's structure and its roles. This course will help students understand personality types, better ways to communicate with customers, how to create rapport, and ways to understand customer needs better.

These classes are intended for your customer service team to help set them up to serve customers better professionally, and leave them with a positive experience!

If you're starting out, or have been in business for decades, there's training that you will find helpful on your path to performance.

### Proactive Customer Service 101



The NCI Online University has something for everyone in your HVAC company - at all learning levels. These courses are created by the NCI team and are focused on helping your organization succeed and grow, at your own pace.

**NCI Members** receive a discount on virtually all the training in our entire online campus (add the **Learning Excellence Premium** or **Learning Excellence Online** package to your membership to get unlimited access for your whole team!).

Learn more about online university at [ncilink.com/OLUni](http://ncilink.com/OLUni).

## Did You Know: NCI Offers Trial Memberships

If you have peers interested in learning more about NCI membership, you can



steer them toward our trial membership program. Trial membership is free for 30-days and allows contractors to "kick" the proverbial tires and see everything they get.

Here is what they get:

- **Unlimited Toll-Free Technical Support from NCI.** Call our team of experts to guide you through technical issues in the field step-by-step.
- **Four-week membership orientation program** with access to unique top-level member benefits, including online training, webinars, and more.
- **Free Technical, Sales, and Marketing downloads** from our members-only area of the NCI website!
- **Access to NCI's High-Performance Talk™** – our email discussion forum. Get advice and technical tips from hundreds of NCI Certified Contractors at your fingertips!
- If they have any NCI Airflow and Air Balancing Certified Technicians in their company, those techs get **Free ComfortMaxx Air™ testing and lead generation** software for 30 days!
- Stay informed with the **NCI Member Newsletter** packed with technical tips, industry updates, and much more!

If you want to give NCI membership a trial run, go to [ncilink.com/trial](http://ncilink.com/trial) and sign up today.



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# Four Simple Steps to Get You on the Path To High-Performance HVAC



**Dominick Guarino** is publisher of *High-Performance HVAC Today* magazine and CEO of National Comfort Institute, Inc. He can be reached at [ncilink.com/ContactMe](http://ncilink.com/ContactMe).

**A**re you having a hard time making performance testing part of your company's service calls and installations?

Here are some simple steps that will help get you on the path to high performance.

**Step 1 – Install test ports on every system your team touches.** Installing test ports is a very simple process, and after a few times, should take less than five minutes. Essentially you drill four 3/8-in. ports using a bullet-tip drill bit (makes a smooth round hole so you can easily insert and remove a test port plug).

Make sure your service and maintenance techs install test ports on every system they service.

LEARNING TO INTERPRET TOTAL AIRFLOW AT THE BLOWER ALLOWS FIELD TECHS AND SALESPEOPLE QUICKLY IDENTIFY POORLY PERFORMING SYSTEMS.

Salespeople should do the same on every sales call (with the customer's permission), and installers should install these ports during the installation process when everything is wide open. [Click Here](#) or go to [ncilink.com/SPTest](http://ncilink.com/SPTest) to download free NCI test port installation and test procedures.

**Step 2 - Make sure every service tech, salesperson, and installer has a manometer** with static pressure tips – and knows where to test and what to expect.

Digital manometers have become more reliable and less expensive than ever. A kit that includes everything you need costs around \$200.

**Step 3 – Teach your team to read blower charts** to interpret airflow from Total External Static Pressure (TESP). Today you have more access than ever to manufacturer blower charts.

They are included in most installation instructions, and can typically be found online.

By learning to interpret total airflow at the blower, your field techs and salespeople can quickly identify poorly performing systems. This information, coupled with the four static pressure readings will help them pinpoint the causes of low airflow, and identify solutions.

**Step 4 – Take the time to educate your team on how airflow impacts performance** – and how to improve every system they come into contact with.

When airflow is sufficient for the equipment to deliver it's design capacity, your systems will outperform those installed and serviced by your competition.

Of course there is so much more to delivered performance. But implementing these four simple steps and making them part of your company culture will give you the strong footing you'll need to deliver better performing systems.

Your next step is to get your team on a training path to continually improve their testing and diagnostic skills. NCI delivers over 150 classes each year nationwide. If you can't find a class near you right away, start by enrolling your field people and salespeople in NCI's online "**Airflow Testing & Diagnostics**" class.

This eight-hour self-directed course is brimming with content and procedures to help your techs deliver and maintain high-performance HVAC systems. For a limited time, you can register at [ncilink.com/ATD](http://ncilink.com/ATD), and use the coupon code **Path2022** to save 30% per student!

I hope you decide to put your HVAC business on the path to high-performance. The rewards are many, including happier customers, well-trained and happier employees, and higher profits for your company.

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October 4-6: Carrollton, TX  
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October 25-27: Tampa, FL  
October 25-27: Columbus, OH

##### Combustion Performance and Carbon Monoxide Safety Certification Program

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October 11-13: Louisville, KY  
October 25-27: Phoenix, AZ

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#### PUBLIC LIVE TRAINING (Continued)

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October 18-20: Los Alamitos, CA

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Visit **NCIlink.com/ClassSchedule** to view the latest schedule.