

# HIGH-PERFORMANCE HVAC TODAY™

*If You Don't Measure, You're Just Guessing!™*



## Are You Ready For Fall?

ALSO IN THIS ISSUE:

**Are You Measuring & Still Guessing?**

**MUST-DO Combustion Safety Tests**

**How to Price Duct Renovations**

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MANAGEMENT:

### How to Price Duct Renovations

When pricing HVAC duct renovations, flat-rate pricing is just the first step. Here are some other considerations.



TECHNICAL:

### Two MUST DO Combustion Safety Tests

Contractor Tom Johnson says the two tests you should always do are checking for ambient CO in the house and conducting a building pressure test.



TECHNICAL:

### Are You Measuring and STILL Guessing?

Jim Davis addresses the issue of whether you are doing the right high-performance measurements.

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# Are You Ready for the Fall HVAC Heating Season?



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

**A**s I write this, temperatures are in the high 80s with humidity checking in around 73%. So, I must be a little nuts wondering if you're ready for the upcoming heating season, right?

From where I sit, however, it's never too early to begin thinking about what you will do to stay busy once summer wanes and the solar engine that drives the air conditioning business begins to cool down.

When that happens, it's time to regroup and start thinking about the future. What changes do you want to make to advance the success and growth of your company at the beginning of the upcoming heating season?

## RECRUITING

The first thing to consider is your team. Do you have enough people to not only handle the tail end of the summer "crazy" season, but to move forward with your growth plans for the upcoming year?

Many experts say recruiting is something you should always be doing, but September is when schools return to session. Maybe it's time to reach out to local high schools to see if they have any career days planned and if you can participate. It's never too early to start planting seeds.

Other ideas: With so many people out of work, you can reach out to special groups, like military veterans, minorities and women, and so on.

## MAINTENANCE AGREEMENTS

Ron Smith, an HVAC Industry business guru and, perhaps, the father of the modern HVAC residential maintenance agreement program, once wrote that "The road to success in the HVAC Industry is paved with maintenance agreements."

If you don't have one, create one now! The fall

heating season is the perfect time to begin selling them. If you already have one, maybe now is the time to update it with new service offerings.

## PERFORMANCE TESTING

Speaking of updating maintenance agreements, do you include performance testing on yours? You should. Performance testing is a relatively low-investment, low-risk business you can add to your existing services that dovetails nicely with a healthy maintenance agreement base.

Performance testing lends itself to sales lead generation from your technicians who do static pressure and airflow testing on every call.

As Ron Smith also says, "Your best source of leads are from existing customers." Maintenance customers can be the biggest source of performance testing leads and profits in the upcoming heating season.

## TRAINING

Let's not forget the absolute need for training. As things slow down in the fall, you need to begin planning to reinvigorate your team with technical and soft skills training. Now is a great time to address any issues your techs may be having. Whether through virtual offerings, local classes, or in-house training, fall is the time to step this up.

By the way, networking is also very important. It's probably been more than a year since you've gone to live meetings, conferences, and trade shows where you can mingle and network with peers. Talk about a great way to recharge your own batteries!

I could go on with more ideas, but the bottom line is this: as summer slows down, are you ready to move forward and take advantage of all the high-performance opportunities that can enhance your upcoming heating season? 

Written By HVAC Professionals for HVAC Professionals

**New NSI 6000 Low-Level CO Monitor**

After several years of careful R&D and design, including software and App development, National Safety Instruments (NSI), introduces the industry's first Bluetooth-enabled Low-Level



Carbon Monoxide (CO) monitor. The NSI 6000 monitor is sold exclusively by professionals trained and certified by National Comfort Institute (NCI), and is not available in retail stores or websites.

Because specialized training and tools are required to diagnose and correct low-level CO issues, NCI, the exclusive worldwide distributor of NSI products, only sells this monitor through qualified, trained resellers.

This unique new product includes a Bluetooth function that syncs the monitor with a smart device. Your smartphone or tablet then communicates with a cloud environment that securely stores activation data and any CO events data.

New event information is synchronized every time the monitor is paired with a smart device.

The NSI 6000 is powered by a long-last-

ing 3V lithium battery, which makes it easy to install anywhere in a home. It can also be used in RVs, boats, vacation homes, hotels, or motels.

The low-level monitor alerts occupants at CO levels of 15 and 35 PPM, and goes into full alarm mode at 70 PPM with no delay. This sets it apart from UL-listed alarms that can take up to 4 hours at 70 PPM to alarm!

This monitor is equipped with the same type of electrochemical sensor used in professional CO analyzers. Each monitor is 100% factory-tested in CO.

For more information on the NSI 6000 go to [nationalsafetyinstruments.com](http://nationalsafetyinstruments.com) or to become a reseller, go to [ncilink.com/nsi6000](http://ncilink.com/nsi6000). 

— By Dominick Guarino, CEO, National Comfort Institute

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# High-Performance HVAC: *Turning the Next Corner*

In 2016, Basnett Plumbing and Heating of Littleton, MA, was the subject of our Spotlight Series. Back then, Owner Rob Basnett talked a lot about the early days of starting the company, the struggles he faced, and introducing High-Performance Contracting™ into the daily culture.

One thing that kept the freshman company out of trouble was Rob's penchant for learning and his mission of continuing education and training. Not just for him. He wanted those benefits for his entire team.



Rob Basnett

“Education and practice are the keys to success,” he said in 2016. “As the team gets better at doing testing and system performance work, we experience

fewer consumer problems we can't solve.”

Five years later, that has not changed. But other things have, and with the fallout from COVID-19, some things will remain changed permanently.

## THEN AND NOW

In 2016 Basnett Plumbing and Heating focused on the residential marketplace, with 97% of the gross revenues coming from that sector and only 3%

from commercial. Plumbing accounted for 32% of those revenues, while hydronics work stood at 26%, and HVAC was 42%.

In 2021, the overall revenue picture, according to Basnett, is double what it was in 2016.

“The pandemic didn't hurt us much either,” he explains. “We are slightly ahead of where we were in 2019. Sure, we lost some revenue during the first quarter of 2020 because the pandemic caused everything to shut down.”

## POST-2020 COMPANY TODAY

Today, Basnett employs 23 people, which is up from the 14 in 2016. “Last year,” Rob adds, “we did a total of \$3.9 million in HVAC and just \$900,000 in plumbing.”

In 2021 he says they are on track to hit \$5 million.

He also points out several other significant changes in the company since we did our first profile. The biggest is a company re-organization.

“During the past five years we divided the company into profit centers. One center focuses on service — the other on installation. For years I had them under one center, but that didn't work for everybody,” he says.

“By splitting them up, we can now incentivize the technicians on the actual work they do. As I did five years ago, we set goals at the beginning of the year. I then use a spreadsheet to track everything and meet weekly with the guys to

see how well they are doing.”

The company also sets revenue goals for ancillary sales, including service agreements and accessory add-ons on the service side. Basnett says installers have different goals.

“Those relate to how many jobs they get done and what the end revenues are,” he explains.

## THE NEED FOR INCENTIVES

Like many HVAC contractors today, Basnett always seeks more technicians. Rob says there is a difference in work ethic between different generations, which has been a challenge. So they've changed how they recruit, train, and incentivize younger people.

For installers, that means creative incentivess.

He says, “We calculate each job for *x-number* of hours, so the techs know how many hours they have to finish the job. If they do it in the allotted hours, they get a 1% bonus based on the total sale price. If we sell the job for \$10,000, the bonus is \$100 if they finish the installation on time.”

Basnett takes that further. If the installer completes the job under the scheduled time, they get 1% of the sale price plus their wage for every hour they went under the expected time!

For the service side, Basnett has an entirely different program. One of the primary metrics, according to Rob Basnett, is the number of callbacks. If a technician has zero callbacks in a

month, he or she receives \$500.

“Callbacks are the bane of the service business,” Basnett says. “I’m happy to pay this incentive because it costs so much more than \$500 to go

out on callbacks.

“During the past five years, we’ve added a process where we meet with our team weekly to go over the spreadsheets, correct any issues we are en-

countering, and keep tabs on the incentives they are earning. This approach has worked very well for us.”

### CHANGES IN DISPATCHING

Another change is that Basnett began dispatching technicians from their homes, plus added an option for them to work four-day work weeks. He began this before the pandemic.

“It really worked out because once the pandemic shut everything down, the techs were already used to working from home,” he explains.

The four-day work week is another incentive. Not all technicians make use of it, but the program is for both installers and service technicians.

“On the service side, we



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make sure technicians rotate. It's a bit of a pain from a scheduling standpoint, but it typically gives participating techs longer weekends (either a Monday or a Friday off)."

**NEW APPROACH TO MEETINGS**

Even how the company, as a team, meets has changed. Rob says that like everyone else, the pandemic forced them to move meetings online.

"Zoom meetings changed everything, he says. "I began customizing meetings for specific smaller groups. Service meetings on Zoom were just for the service teams. Same with installation meetings. Plus, we added weekly Zoom meetings for the office staff," he says.

"Another advantage is that virtual meetings lead to better attendance. They are just so much more efficient. I love this approach and intend to continue using it from now on."

**REVAMPING TOOL POLICIES**

Because he believes in the high-performance approach to delivering total comfort, Rob understands the need to invest in quality tools and instruments. From early on in his company's history, he had a written tool policy where the company provided each technician a monthly allowance for tools.

Over the years, he noticed some of his team would wait until they earned enough in allowance money to buy tools, and then they'd leave and take those tools with them. This practice became a huge cost for the company.

As time moved on, instrument technology improved, moved toward wireless communications, and cost more.

So something had to be done.



The answer was to create a different type of vesting approach. Rob explains the accrual part of their plan remains unchanged, but techs cannot become fully vested until they've been with the company for three years.

**ANOTHER CORNER TURNED**

From a performance standpoint, Rob Basnett says he feels that doing air upgrades, duct renovations, and static pressure testing is more standardized today in the company's processes.

"But we can't take our eye off the ball," he adds. "I believe what gets focused on gets done, and it's the consistency that has been the toughest part of the performance process."

He says he believes the company turned another corner when they customized the performance approach to match the team's skillsets.

"We do a lot of duct renovations and air upgrades on nearly every new install. We never swap out equipment. It's just incorporated with our replacements, a core part of our business."

**STAYING THE COURSE**

Basnett says he finds it amazing how many HVAC contractors don't under-

stand the importance of airflow. The reason? He says it's a training issue.

"If you don't invest in training, you can never exceed what you already know. You have to understand the importance of training before you can do anything with it," Basnett explains.

Staying the course, from Basnett's perspective, means committing to training.

"Last year, during the pandemic shutdowns, I targeted my training effort on those employees who committed to training, who actually do it, then put it to use.

"My philosophy is if you're not willing to invest in yourself, I'm not willing to invest in you either. The result: we spent less money last year, and that worked well for us."

**SETTING THE STAGE**

Though the pandemic hurt much of the U.S. economy, it also set the stage for the company to break records in sales and revenues. With reduced staffing and hesitant customers, Rob had to rethink his approach to the market. Setting up incentive programs and making necessary process changes helped the team make up for any losses incurred early in the shutdown period. Basnett says they are well on track to having a record year.

"I think by focusing on what's important — bringing a performance perspective to our customers — and remaining among the top problem-solving HVAC companies in our area, is why we are as solid as we are today," Rob concludes.

For these and many other reasons, *High-Performance HVAC Today* magazine once again shines its contractor spotlight on the team at **Basnett Plumbing and Heating** in Littleton, MA. 

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# How to Use Flat Rate Systems for Pricing Duct Renovations

**W**hat kind of crazy person would choose duct cleaning, duct renovation, and duct replacement calls in the heat of a Georgia summer when they could exclusively take HVAC system replacement work?

My brother, Dallas, that's who. Wait! Don't stop reading! And Dallas, don't disown me!

Now, why oh, why would anyone who knows two cents about HVAC prioritize duct leads during prime system replacement season? And if you do choose any of these leads, how do you price them?

So my brother explains it like this: Duct renovations can typically be done in less than a day. This summer, he is focused on scheduling three duct cleanings per day at an average of \$1,400 per cleaning. These cleanings pave the way to better efficiency, indoor air quality (IAQ), and health discussions with his customers, leading to duct sealing, renovation, and replacement projects.

Maybe Dallas isn't such a crazy person after all! Perhaps we've been missing something!

## KNOW YOUR DAILY TRUCK REQUIREMENT

Many contractors get stuck in the weeds trying to figure out pricing for duct renovations. However, the solution is easier than you might think. The key is to know your daily truck requirement. In other words, you need to know the gross revenue

responsibility of each truck each day.

If you don't know your daily truck requirement, you'll never know if you're pricing jobs right or not. If you do know your daily requirement per truck, you can use the following rule of thumb to find a flat rate price for your work:

$$\text{Price of job} = (\text{Daily Truck Requirement} \times \text{Portion of Day}) + \text{Parts}$$

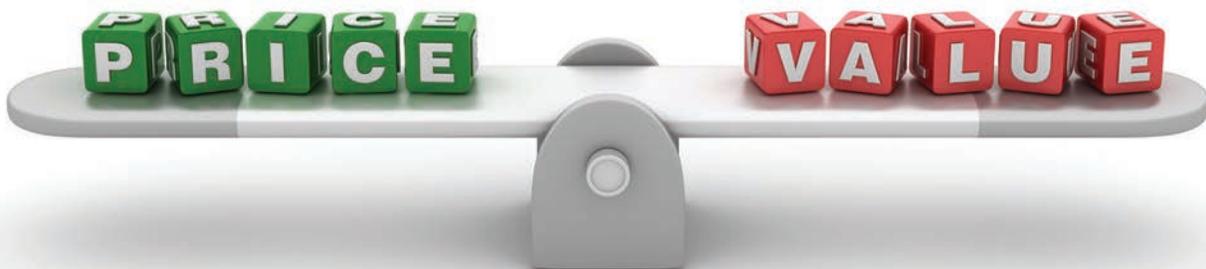
I'll break that down. Let's say your daily requirement for a truck is \$2,000 per day for a typical service vehicle. That means each day, each truck is responsible for bringing in \$2,000 of gross revenue.

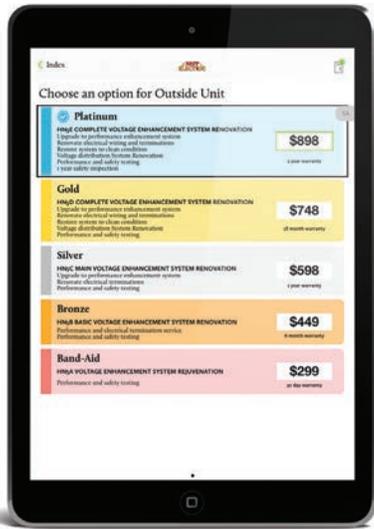
When you get the job, determine how long it will take. If the job is  $\frac{1}{4}$  of a day, that equals two hours,  $\frac{1}{2}$  a day (4 hours), or one full day (8 hours). Why not  $\frac{3}{4}$  of a day? Ha, you know why! There's no such thing as a  $\frac{3}{4}$  day job!

So, if the daily requirement for a truck is \$2,000, the breakdown looks like this:

- $\frac{1}{4}$  day job = \$500
- $\frac{1}{2}$  day job = \$1000
- One day job = \$2000.

For a  $\frac{1}{2}$  day job at this rate, then, the price =  $(2000 \times 0.5) + \text{parts} = \$1000 + \text{parts}$ . A  $\frac{1}{4}$  day job is  $\$500 + \text{parts}$ . And a 1-day job is  $\$2,000 + \text{parts}$ . Notice I keep saying plus parts! You know that





**Flat-rate pricing screen on an iPad. This doesn't include any ancillary or upgrade sales pricing, which you should also sell.**

well as the ever-changing cost of parts.

What's the problem with this flat rate formula? Just that — it's a flat rate. This price is just the minimum needed to meet the daily requirement for each truck. If you price at

this level, if you don't close every call, or for the calls you do close, you earn the least amount possible.

### PRICE VERSUS PRICING PROFITABLY

The other problem with this flat rate formula? **Not every job has a "minimum" or basic repair.** Some jobs take more skill, time, and work than you might anticipate. So, if you use this

formula and find you cannot totally fix the problem at that price, you are doing a disservice to your customers, aren't you? That's when customers don't receive value for the money spent.

So, the above formula is an easy way to flat rate your duct renovations but is the bare-bones minimum. How can you fix this problem? By providing your customer options to do several levels of service, you can price your calls profitably.

The question isn't how to price duct renovations using flat rate systems. The question is how to price duct renovations profitably.

So, you choose. **Do you want to price, or do you want to price profitably?** If you only want to flat rate price and nothing more, you can stop reading.

the prices of parts and materials are increasing and are all over the board right now. You must calculate your parts costs separately, or you'll never break even, let alone make a profit.

This formula works for most types of jobs since it considers the parts variable for the type of job you are on as

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That formula was the whole punch-line. If you are curious about how to make that pricing profitable, keep tracking with me.

### MAKING MONEY

Forty years ago, flat rate pricing did change the way the market worked. But it also made pricing inflexible. **All flat-rate pricing means is upfront pricing – upfront, no surprises, sell the job, get the check;** that's what it was all about.

Making money is about something completely different. You must understand what things cost and what will the market bear? Once you know that, you can provide customers with options.

Think of it this way: there aren't two pans for the scale of justice; there are three – a tri-level scale. Those three pans are:

- **Our cost**, based on calculations like that formula I gave you above.
- **What will the market bear?** How can you justify your low cost with a market that might bear an incredibly high price?
- **Value.** By adding value, you can build options and offer your customers choices.

We used a third-party research company to do a deep dive into the profitability of options, and the results were unanimous: 80% of your customers will choose a higher price over a bottom-floor flat rate price every time. So why, then, would you ever only offer one flat rate price for a duct renovation?

It's a new way of thinking. Take your costs and then look at your assets (what you have that builds value).

### THE IMPORTANCE OF VALUE

*Skill, talent, knowledge, craftsman-*

*ship, experience, and tender-loving care will increase the value on top of the cost. It will allow you to go above that flat rate price we just calculated.*

Let's break those qualities down to see how we might quantify them.

Ask yourself:

- What talent do I have that I can add to my parts and labor to increase the value of this job?
- What knowledge do I have that will increase the value of this job when added to the parts, labor, and talent?

I'm suggesting that you may never have thought about how much value each of your assets has that can help you be more profitable.

Now watch.

Let's make those valuable qualities concrete, not just hypothetical.

**Knowledge:** what do you know? You know that in your market, duct leakage costs as much as 50% of the efficiency of the equipment. Therefore, you know that duct renovations will make a significant difference, even if you don't replace the system.

That knowledge brings value. What is something you could do with that knowledge – beyond a basic repair – that would be better for the customer and for which you could charge?

**Talent:** Through your experience and training, you know several ways to increase and enhance airflow efficiency, functionality, and performance through ductwork.

As a result, you can add duct modifications where needed that will improve overall system performance. Do you think that's worth anything?

**Skill:** Again, your training and experience helped you build the skill and craftsmanship to do a fantastic job using many different methods - whether using bub-

ble wrap, fiberglass, or spray foam. You are an expert with many ways to accomplish this project. Is that worth anything?

**Wisdom:** in HVAC terms, knowledge is gained over time by being exposed to many (often dangerous) obstacles, many instructors, and by trying lots of things. Therefore, your wisdom brings enormous value to duct renovations. Plus, the more you do them, the more knowledge and experience you gain, which adds a great value.

### ADD IN A DASH OF LOVING CARE

When people are so happy if you show up and do what you say you will do, **tender-loving care** adds enormous weight to the value equation.

Life is a test; give it a run for the money! I've given you two formulas. Let me now give you this powerful secret for success: Low Cost Plus High Value Plus Understanding how there is no ceiling to "what the market will bear" equals profits never seen before in home services.

These are the things you consider when you build a menu of options off the calculated flat rate price. Think about what the job requires—that's the floor. Now dream bigger. What bit more could you do for your customer that they would see as valuable? Then get paid for doing it. 



**Danielle Putnam** is president of The New Flat Rate – a home service menu-selling system designed to put profit directly into the hands of HVAC contractors. She is a forward-thinking businessperson who helped her father start The New Flat Rate and previously worked as director of business development for a large digital service firm. She can be reached at [ncilink.com/ContactMe](http://ncilink.com/ContactMe).

# Are You Measuring and Still Guessing?

**T**he motto at National Comfort Institute (NCI) is, “If you don’t measure, you are just guessing.” However, is it possible that you are measuring and still guessing? The answer depends on what you are measuring. Do your measurements have real value, or are they just token readings? Do you fully understand the meaning of specific measurements?

There is an abundance of information available that recommends taking measurements — whether in technical manuals, installation manuals, or on the internet. There is information on venting, combustion air, building depressurization, gas pressure, O<sub>2</sub>, CO<sub>2</sub>, CO, flue temperatures, draft, Delta T, and airflow, to mention a few. How much of this is based on theory, opinion, or actual field testing and verification?

## OBSERVATION VERSUS MEASUREMENT

Something you should eliminate immediately as a diagnostic measurement is smelling!! One recent manufacturer’s installation manual recommends smelling outside and inside their equipment. Another manual tells you to smell the flue cap for proper combustion. Even a gas company wants the installer or service tech to smell around the house for CO!

**Fact:** smelling for proper combustion is not only guessing but also possibly life-threatening. I would place the other human senses (seeing, hearing, touching, and tasting) under the observation category rather than as measurements.

Let’s start with something as simple as a draft, match, or smoke test. According to many procedures or codes, either test is a method to verify equipment is venting.

In some cases, a certain value is given to the draft reading based on outside temperatures to establish

the minimum required draft for proper venting.

No draft test or smoke test can quantify what is going up a flue, much less if the equipment is venting at all. No test is more misleading or dangerous than a smoke test on natural draft equipment with a drafthood. You will only be guessing if this is how you are measuring!

## CODES ARE OFTEN NOT GOOD ENOUGH

What about combustion air? Based on code, adequate combustion air happens if there is an area of 50 cubic feet or a

one-square-inch opening to the outdoors (possibly a high and a low opening) per 1,000 Btus of input. Though this may be the proper area or opening to the outdoors, there is no guarantee that air is getting to the equipment.

A 2000 ASHRAE study and report found that the approved code on passive combustion air — as cited above — fails to perform adequately under many field conditions. We call this another assumption of measurement, and it will leave us guessing!

## GAS PRESSURE: LEGIT OR NOT?

Measuring gas pressure is always recommended, but what kind of diagnostic information does this provide? Utility experts often say that tampering with gas pressure is a significant safety detriment.



Knowing how to measure is great. But if you don’t understand what the numbers mean, you are just guessing.

Ask yourself this: does 3<sup>1</sup>/<sub>2</sub>-in. w.c. equal a certain amount of Btus? Does this verify a proper fuel/air mixture? What is the Btu content in gas? Do you need to know the actual size of the burner orifices?

Gas pressure is more of a reference number than a valid measurement to verify proper performance. If this is one of the primary measurements on which you base equipment performance, you are guessing.

### GUESSING USING DELTA T?

So far, we are using the measurements recommended by HVAC industry standards or equipment manufacturer specifications.

Another measurement used for furnaces is **Delta T** or temperature rise.

One would think that in heating mode, the temperature rise would be consistent regardless of the manufacturer, model, or equipment size, much like that of cooling equipment.

But somehow, this is not the case. Depending on furnace size, you'll find manufacturer-recommended temperature rises in these general ranges:

- 25 to 55 degrees
- 35 to 65 degrees
- 40 to 70 degrees
- Even 50 to 80 degrees.

If you check, you'll find most heat exchanger designs are similar, much like evaporator coils for air conditioning.

Can the airflow have that wide of a range?

Using the formula **CFM × Delta T × ADF** correctly, the lower Delta T ranges would require CFMs that are not available.

Example: You encounter a 90% efficient furnace rated for 100,000 Btu input and 90,000 Btu output. It has



an allowable Delta T of 30°. To deliver 90,000 Btus, you would need a blower running at 2778 cfm, which I do not believe is an option.

Therefore, setting blower speed by Delta T only, even if within manufacturer specifications, means you may be measuring, but you are still guessing.

### USING DIGITAL COMBUSTION ANALYZERS

Today, many contractors use digital combustion analyzers to take system measurements. In the past, only oil-fired equipment was combustion tested, and that often was done using observational techniques.

For gas-fired equipment, if technicians observed a blue flame, they considered combustion was good. Talk about guessing without measuring.

But with the development of handheld combustion analyzers, the importance of combustion testing all types of fuel equipment is now recognized as vital, especially when it comes to carbon monoxide.

Yes, even with a blue flame, CO can be in deadly ranges.

Digital analyzers measure O<sub>2</sub> (oxygen), CO (carbon monoxide), and flue temperature. Other readings include calculations based on interpolation, interpretation, and assumption. As much as manufacturers may not like

hearing it, the CO<sub>2</sub>, air-free CO, and other efficiency calculations are misleading and still leave us guessing.

Before getting into actual measured values, what does a digital combustion analyzer do versus old types of combustion instruments? You can compare the difference between a sundial to a digital watch or a polaroid camera versus a video camera.

The old equipment gave us a single reading or a still picture. The new equipment does a continuous update of what is happening.

It should be standard practice to do a combustion test from the beginning of equipment operation until the very end because of potential unstable or deteriorating combustion. If you use only one reading after five or 10 minutes, you are measuring but potentially still guessing.

That would be like taking a single picture of a football game at halftime and then trying to determine who won the game. You may be occasionally correct, but that is still guessing!

### IMPORTANT MEASURED VALUES

Finally, let's look at the valuable measurements of a combustion analyzer: O<sub>2</sub>, CO, and flue temperature. Just measuring them doesn't do us much good if we don't know their proper ranges.

Today the only recognized reading is carbon monoxide. The general industry acceptance is to keep CO below 100 ppm in the flue gases. Occasionally, different carbon monoxide ranges show up in recent installations, but mostly on modulating-condensing boilers.

Flue temperature ranges are rarely listed, which are difficult to determine without multiple field applications and testing, given all the variables in the field.

The good news is that organizations like National Comfort Institute have established such flue temperature ranges by conducting thousands of actual field tests and applications over the years. These are not things that the manufacturers can control or list.

So, you have a combustion analyzer. You take some measurements. You have no clue if those measurements are good or bad.

This is where training comes into play. Understanding what your measurements mean cannot be learned from YouTube™ videos. They are not black and white, either. You must learn to interpret those measurements and use the results to diagnose what is happening in the system.

NCI offers combustion and CO classes. Learn more here: [ncilink.com/COTest](http://ncilink.com/COTest).

If you don't know the proper operating equipment measurement parameters, even using the latest and greatest digital instruments leaves you still guessing.

Measuring is one of the most important things we can do today, and we have the best instruments to take those measurements.

However, if we don't understand the ranges where measurements should fall within or what they mean, we are still guessing. 



**Jim Davis** is the senior instructor for National Comfort Institute (NCI). He has a long and storied career in the HVAC industry. That career began back in 1971. Today he is considered one of the HVAC

Industry's foremost authorities on combustion and carbon monoxide safety. Jim is credited with developing the first combustion testing protocols and field diagnostic methodologies using digital combustion analyzers. To contact him, go to [ncilink.com/ContactMe](http://ncilink.com/ContactMe).



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# Two Combustion Safety Tests You 'Must Do'

**E**very time one of our employees enters a customer's home or building, we take responsibility to assure both our technician's and customer's safety. Case law across America has proven that ignorance of this fact is no defense.

Let's face it. HVAC system failures can and do happen. When someone (a homeowner or your technician) becomes ill or injured from Carbon Monoxide (CO) poisoning, you can be on the hook as the business owner.

On the *Heating Safety Inspections* website, [safetyinspections.org](http://safetyinspections.org), it states, "Generally, HVAC contractors and HVAC technicians are held legally responsible for HVAC work.

"As an HVAC contractor or HVAC technician, you could be held liable for installation or maintenance mistakes involving furnaces, boilers, and other HVAC equipment."

Thus, every employee who enters a customer's home must perform two *must-do* safety tests every time.

These two tests are:

- Check for the presence of ambient CO
- Conduct a basic building pressure test.

Again, because you are the HVAC professional, assuring customer and employee safety is 100% your responsibility as the business owner or manager.

Every building that your people enter potentially has excessive levels of CO. The only way to know for sure is to test. A calibrated combustion analyzer in the hands of a trained operator is the most accurate way to do this. The reality is, this can be cumbersome.

## PERSONAL CO MONITORS LEAD THE WAY

We've found a much easier way is to have all our field staff wear a belt clip formerly called the CO Angel, now the Industrial Pro.

For around \$200 per person, you can assure that no building your people enter has high ambient CO levels. We recommend you provide every field person one of these and require them to wear it on every call. I guarantee you will be surprised at how many buildings have an issue with carbon monoxide, and without testing, you would have never known.

By the way, Industrial Pro personal monitors are available from National Comfort Institute

The Industrial Pro is a personal CO monitor that is small enough to clip to your pocket and fit into the palm of your hand. Yet it is powerful enough to measure low levels of CO, down to one part-per-million.



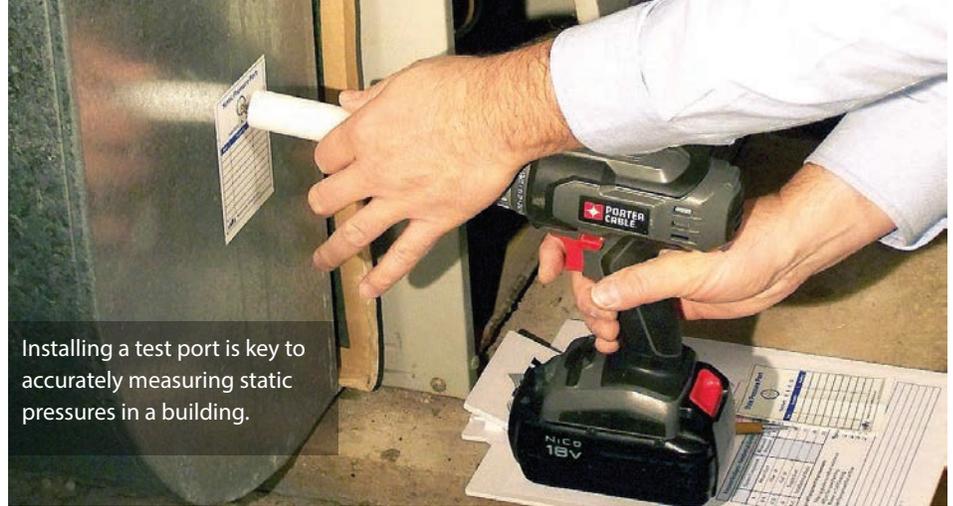
(NCI). Click here for more information: [ncilink.com/IndPro](http://ncilink.com/IndPro).

The other must-do test is a basic building pressure test. The tools required for this test are quite minimal. You need a battery drill, a drill bit, and a drill bit sleeve to install test ports.

You can learn more about adding test ports to an HVAC system here: [ncilink.com/TestPorts](http://ncilink.com/TestPorts).

You'll also need to provide a \$50 Dwyer 460 draft gauge ([ncilink.com/Dwyer460](http://ncilink.com/Dwyer460)) to measure draft. You can then test the draft in any chimney within the building. All chimneys should have a .01-.02-in. w.c. draft in them, or it's time to start looking for why they don't.

Visual inspections can be beneficial but, you need to learn what to look for in terms of the following:



Installing a test port is key to accurately measuring static pressures in a building.

- All the CO sources within the building
- The visual clues of CO spillage
- The building pressure influencers
- Typical building pressure visual indicators.

After you learn and understand these things, you can begin having conversations with your customers about these problems and explaining how to correct them. You will soon find the additional income generated from these two basic tests quickly pay back

any educational costs incurred learning how to test and fix these problems.

At Summit 2022 in Scottsdale, AZ, I will be hosting a seminar to discuss these topics more in-depth. If you haven't registered yet, click on [gotosummit.com](http://gotosummit.com) and get yourself squared away. I hope to see you there.

To learn about this subject more in-depth, it would be helpful for you and your technicians to attend the CO and Combustion three-day class to earn certification in these procedures.

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Watch for more NCI information as several such classes will be held around the country this fall and winter. Look for one coming to an area near you.

Furthermore, the Safety Inspection website has some reference tools you can use to keep you, your teammates, and your customers safe. Check them out here: [safetyinspection.org/references](https://safetyinspection.org/references). 

**Tom Johnson** is a Plumbing and HVAC contractor from Cambridge, MN. Johnson has more than 40 years of industry experience and 10+ years of experience in the area of testing and repairing CO problems in the field. If you have questions on combustion safety, he can be reached at [ncilink.com/ContactMe](https://ncilink.com/ContactMe).



## See Tom Johnson During NCI Summit 2022

The High-Performance HVAC Summit 2022 is happening in person from April 4th to the 7th, 2022 at the We-Ko-Pa Resort in Scottsdale, AZ. Our theme this year is *"This Time It's Personal!"* and it reflects the first live gathering of High-Performance HVAC contractors since the start of the pandemic.

**Tom Johnson of T.M. Johnson Brothers, Inc., Cambridge, MN** is one of eight speakers showcasing the positive impact of high-performance on your companies. This article is based on Tom's upcoming session.

Summit 2022 will offer you and your team the opportunity to make it personal: You can customize your program based on where each of your team members are on the **Path to Performance**. Each breakout has three options, totalling 18 personalized learning opportunities. The options are for those at the **Novice** level, the **Practitioner** level, and the **Mastery** level.

Summit 2022 includes NCI's traditional **Tradeshow** (where you can learn about the latest products and services from our industry partners), **several general sessions**, the popular **Idea Meeting**, and their coveted NCI contractor and individual **award presentations**.

You can learn more about the 2022 High-Performance HVAC Summit online at [GoToSummit.com](https://GoToSummit.com).



## ONLINE TRAINING: Stay Safe and Keep Learning!

You can achieve social distancing, and make sure that you stay sharp with NCI's Online University. Classes are created by NCI's curriculum-development team in-house and feature NCI's education specialists. They include both testing and measuring HVAC systems as well as business best practices. Training emphasizes performance-based results using:

- Measuring Static Pressure
- Airflow Testing
- Duct System Testing
- System-wide Temperature Diagnostics
- Managing Business Performance
- Creating the Ultimate Customer Experience
- And much more!




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Find out More: Call **800-633-7058** or visit [www.ncilink.com/OnlineU](https://www.ncilink.com/OnlineU)

## Welcome New NCI Members



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

So, it is our pleasure to recognize and welcome those new members who joined our ranks since December 2020:

- **A/C Pros Kingman**, Kingman, AZ
- **Balancing Technologies Inc.**, Pepperell, MA
- **Bruin's Plumbing and Heating Ltd.**, Red Deer, AB
- **Cool Comfort Services**, Plymouth, MA
- **Fixed Right and Guaranteed**, Huntingtown, MD
- **Home Heating & Cooling**, Bend, OR
- **Kuhn Air Conditioning**, Nashville, TN
- **Paramount Heating and Air Conditioning LLC**, New Albany, OH
- **Picture Rocks Cooling Heating and Plumbing**, Tucson, AZ
- **RES Air Cond.**, Henderson, TX
- **SABRS Home Comfort**, Lewes, DE

- **Service First Pros, LLC**, Auburn, GA
- **SoCal Airflow Pros**, Rancho Santa Margarita, CA
- **SOCO Heating & Cooling**, Colorado Springs, CO
- **Southern Plumbing, Electrical, Heating and Air**, Aiken, SC
- **SuperTech HVAC Services**, Timonium, MD
- **Texas AirZone**, Dallas, TX
- **The Lee Thompson Co.**, Houston, TX
- **Top Tech Mechanical Services, Inc.**, Kennesaw, GA

- **Vailes Heating & Air**, Staunton, VA
- **Van's One Hour Heating and AC Inc.**, De Pere, WI
- **WCT System Repair**, Hialeah Gardens, FL.

We are pleased you all opted to join our family and look forward to hearing from you. Please look for regular member benefits updates here and in our digital magazine.

If anyone has questions about their membership, please call our Customer Care line at 800-633-7058.

## Ladies and Gents: Your August PowerPack is Ready!

Membership does have its privileges and the monthly PowerPack is one of many you receive as an NCI member.

Hopefully, you took advantage of all the great tools from your July PowerPack, which included tools and training focused on energizing your team as you integrate testing and diagnostics into your company's culture.

This month we focus on field measurement tips and tools.

**Please Note:** Some of the tools included in the PowerPack each month may not *normally* be accessible with your membership subscription package. However, you will be able to access these tools through this PowerPack portal during the current month.

We think you'll find these materials very helpful as you continue to grow your High-Performance HVAC business.

The August 2021 Power Pack consists of the following:

- **System Temperature Measurement Basics (Online Training)**
- **Enthalpy Chart (Download)**
- **CoolMaxx™ Report and Procedure (Download)**
- **Measuring Wet Bulb Temperature Tech Tip (Download).**

Be sure to share the August PowerPack with your entire team.

Just go to [ncilink.com/PwrPak](http://ncilink.com/PwrPak) to access it today.

If you have any questions or cannot access any of the tools in this program, please contact us at 800-633-7058.





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# Answer These Five Questions to Increase High-Performance Leads This Fall



**Dominick Guarino** is publisher of *High-Performance HVAC Today* magazine and CEO of National Comfort Institute, Inc. He can be reached at [domg@ncihvac.com](mailto:domg@ncihvac.com)

If you own a traditional residential service and replacement HVAC company, the following questions, if answered honestly, will help you determine if your company is prepared for super lead generation this fall:

- Is your business built around selling as many replacement “boxes” as you can every week?
- Assuming you pay yourself a salary, rather than pulling your income out of “profits,” is your company’s net profit after ALL direct costs and expenses less than 10%?
- Do you have less than 200 **Maintenance Agreements** per million dollars in total sales?
- Is your primary lead generation method for replacement sales from advertising and internet?
- Do system performance renovation revenues represent less than 5% of your total sales?

By answering yes to two or more of these questions, you are likely on track to get the same results you’ve been getting, especially in the second bullet point. Our industry still tracks at less than 3% real net profit.

Let’s explore some highly-profitable, low-risk services you can add to your existing business:

## LOOK TOWARDS MAINTENANCE AGREEMENTS

The most obvious, and most common profit center adopted by successful HVAC companies is a large maintenance agreement base.

Imagine what that could do for your business! Your seasonal swings would be leveled significantly. You could capitalize on the economies of doing a high volume of maintenance, and the resulting repair work. Plus the leads for replacements would be HUGE!

Remember: building a solid agreement business takes a focused effort with good processes and a strong commitment.

## ADD IN PERFORMANCE TESTING

Here is another low-investment, low-risk business you can add to your existing services: performance testing, system improvements, and duct renovations.

These two disciplines work really well together. Imagine how many leads you could generate if your team performs basic static pressure and airflow testing on every home in a large maintenance customer base.

Remember: your best source of leads for high performance work are your existing customers, especially maintenance agreement customers.

## TRAINING IS CRITICAL

Good training is critical to success, but the approach is simple. It starts with service techs who have the tools to measure static pressures, interpret airflow, and test combustion during every service and maintenance call.

These highly skilled techs have the training to ask customers the right comfort questions. When they find opportunities for improvement, which will be most of the time, these techs share the information with your customer in layman’s terms, then offer to bring in your comfort specialist to perform further testing.

When you can fix performance problems and right size a system with higher efficiency and better performing equipment, your customers will be more than satisfied. They will become raving fans and your best source for referrals!

The next step is to confirm the appointment and send in a trained salesperson with the right tools and knowledge to offer the right options to improve their HVAC system’s performance.

This approach will help you obtain more leads to insure a great fall season. What a great way to move you towards building a more profitable, sustainable, and valuable business for years to come. **NCI**



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### Upcoming 2021 NCI Training Schedule

#### **Residential HVAC System Performance & Air Balancing Certification Program**

Aug 24-26: Centennial/Denver, CO - **SOLD OUT**

Sept 14-16: New Hudson, MI  
 Sept 21-23: San Antonio, TX  
 Sept 28-30: Las Vegas, NV  
 Sept 28-30: Baltimore, MD

#### **Duct System Optimization & Residential Air Balancing Certification Program**

Sept 14-16: Mesa/Phoenix, AZ  
 Oct 12-14: Dayton, OH  
 Oct 5-7: Dallas/Carrollton, TX  
 Oct 5-7: Chicago/Wood Dale, IL

#### **Commercial Air Balancing Certification Program**

Oct 5-7: Tampa, FL

#### **Combustion Performance & Carbon Monoxide Safety Certification Program**

Aug 17-19: Minneapolis/Bloomington, MN  
 Aug 24-26: Salt Lake City, UT  
 Sept 21-23: St. Louis/Earth City, MO  
 Sep 21-23: Louisville, KY  
 Sept 28-30: Union City/Atlanta, GA  
 Sep 28-30: Mason City, IA  
 Oct 12-14: Philadelphia, PA  
 Oct 19-21: Phoenix, AZ

#### **National Balancing Council Commercial Balancing with Certification**

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Sept 14-16: Los Alamitos, CA

#### **Combustion Performance & Carbon Monoxide Certification Program**

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