

HIGH-PERFORMANCE HVAC TODAY™

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



SUMMIT 2025

Navigate Your Path to Performance

September 9-12 • Austin, TX

ALSO IN THIS ISSUE:

- Selling High-Performance HVAC Maintenance Agreements
 - Solving Top 10 Inverter Issues
 - Total HVAC System Rating with ComfortMaxx™ and measureQuick®



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HIGH-PERFORMANCE HVAC TODAY™



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The Cure for HVAC Commoditization Is Measured Performance



Mike Weil is editor-in-chief and director of communications and publications at National Comfort Institute, Inc. Contact him at ncilink.com/ContactMe.

We all see it happening. You quote a job, spend the time designing a proper system, talking through customer comfort concerns, and running the numbers. Then the homeowner jumps online, finds a third-party platform promising a “certified” install for a few thousand less, and suddenly you’re the bad guy for “overcharging.”

This is the era of commoditized HVAC. There are so many companies selling based on price versus quality and a flood of aggregator companies coming in and competing for clicks. These practices make it harder for homeowners to recognize real value, especially the kind delivered by [High-Performance HVAC™ contractors](#).

WHEN HVAC BECOMES A RACE TO THE BOTTOM

There’s no shortage of industry voices warning against this trend. [Competing based on price is a race to the bottom](#). We’ve all seen how that movie ends — corners get cut, systems don’t perform, callbacks increase, and trust erodes. The customer may have paid less upfront, but they often end up with a poorly performing system and buyer’s remorse.

From where I sit, the problem isn’t just price, it’s about *perception*. Homeowners are conditioned to believe HVAC systems are plug-and-play appliances. They don’t realize the best equipment still needs a properly designed, installed, and tested system behind it — or it won’t work as promised. Plus most don’t understand [that system requires service](#) — just like their cars.

HIGH-PERFORMANCE CONTRACTORS HAVE AN ANSWER

Here’s where High-Performance HVAC contractors have a powerful advantage: *measured*

performance. When we document system performance — before and after improvements — using static pressure testing, airflow measurement, and temperature diagnostics, we shift the conversation away from price and toward *value*.

When you can prove the results of your work, you earn trust. You’re no longer selling equipment; you’re delivering *verified comfort* and *measurable efficiency*. That’s something aggregators and low-bid competitors simply can’t match.


WHY TRUST IS EARNED; NOT ASSUMED

We need to face a hard truth: *Homeowner mistrust isn’t going away*. And frankly, they have good reason to be skeptical. Too many installations fall short of their promises. SEER ratings don’t match reality. Rooms remain uncomfortable. Utility bills don’t drop.

But that mistrust becomes an opportunity when we prove results. The minute you show a homeowner the airflow data, the corrected duct leakage numbers, or the improvement in delivered Btus, you’ve created a moment of clarity. That’s when they realize you’re not just another installer — you’re a professional.

PRICE ISN’T THE PROBLEM; IT’S THE PROOF

When homeowners say, “That other guy was cheaper,” the answer isn’t to match his price. No, it’s to match your work to their expectations. Show them what they’re really paying for: a system that delivers on its promises. And then show them how you’re going to verify it.

The truth is, High-Performance HVAC isn’t expensive. It’s valuable. The difference is in the delivery. If we want to rise above commoditization, we need to stop selling boxes and start selling outcomes. And outcomes can’t be guessed at — they must be measured. 



PARTNER Highlights

Written by HVAC Professionals for HVAC Professionals

Sauermann Introduces New Digital Manifolds

The Sauermann [Si-RM350](#) and [Si-RM450 digital manifolds](#) are built for modern HVAC and refrigeration work: fast, connected, and A2L-ready.

The company's newest digital manifolds, the Si-RM350 and Si-RM450, will be showcased at National Comfort Institute's [2025 High-Performance HVAC Summit](#) in Austin, TX, September 9-12.

These instruments are designed to handle tough HVAC jobs with precision, speed, and smart connectivity. Whether working with heat pumps, commercial refrigeration, or mini splits, these tools help High-Performance HVAC™ contractors work smarter, not harder.

Why do these manifolds stand out?

- Work with A1, A2L, and A3 refrigerants, no limitations on the job
- Fast-response NTC sensors for rapid, accurate readings
- Durable anti-glare glass screen, crystal clear, even in direct sunlight




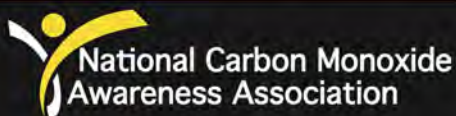
- Parrot-beak temperature clamps for better grip and faster results

- Wireless range up to 328 ft, stay connected from the truck or rooftop
- All-in-one system: pressure, vacuum, temp, and psychrometrics.

Pair the manifold with [Sauermann's new Pilot app](#) to view live measurements, record data, manage customer profiles, and generate ready-to-send reports. The app is compatible with [iOS](#) and [Android](#) and is completely free.

The Sauermann instruments ecosystem also includes compatible load scales, vacuum pumps, and accessories. Everything HVAC pros need for charging, evacuating, or commissioning.

Built for real-world work. Engineered for results. Learn more at www.sauermanngroup.com. And be sure to visit them at their Summit booth. 



Calling All HVAC Leaders: We Need You

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Upcoming Classes
Friday, Sept. 5
Friday, Oct. 24



Breaking Barriers: How to Redefine High-Performance HVAC™

In the ever-evolving world of HVAC, standing still is never an option — especially when you're a contractor operating in one of the most regulated, language-locked markets in North America.

That's why Anthony Woo and his company, [Climatisation ACG](#), stand out. Based in a modest office just outside Montreal, Anthony has grown a small startup into a thriving business grounded in education, High-Performance HVAC™ testing, and relentless customer service.

What's even more remarkable is how he's done it: with unbranded trucks, zero marketing budget, and a team made up almost entirely of HVAC newcomers.

"None of my guys had prior experience when they joined Climatisation ACG," Anthony explains. "We've got former tattoo artists, gamers, musicians, even a precious metal trader on staff. Our entire crew has been built from the ground up."

FROM HELPER TO HIGH-PERFORMANCE LEADER

Anthony Woo's HVAC journey began two decades ago as a field helper. He worked shoulder to shoulder with his future business partner, Kar Young Tom (also known as KYT), for 16 years before launching Climatisation ACG.

"We knew each other's work ethic. We'd done 60-to-80-hour weeks

together. So, when it came time to start our own thing, there was no hesitation," says Anthony.

That mutual trust paid off. In just three years, Climatisation ACG surpassed its five-year revenue goal, achieving \$1.3 million in annual sales. Anthony says they hit their seven-figure target two years ahead of schedule.

"It completely changed the way I view our potential. Now, I'm realigning everything to focus on long-term sustainability and consistent quality," he adds.



Left to right: Climatisation ACG partners Kar Young Tom and Anthony Woo.

That means he is concentrating on internal consistency, not just growth.

CUSTOMER SERVICE ABOVE ALL

For Anthony Woo, customer service isn't a department — it's the business model. "I tell people we don't sell machines — we sell service," he says.

That mindset has earned ACG nearly

four straight years of perfect five-star [reviews on Google](#) and Facebook.

"We got dinged once by someone who didn't use our service because they didn't like our pricing. It's like giving a Michelin-star restaurant one star because the menu is too expensive. But other than that, it's been all five stars."

Anthony's approach to service is proactive and tech-forward. He'll often walk homeowners through a basic diagnostic or maintenance task over messaging before rolling a truck.

"If I can save someone \$240 by helping them clear a clogged drain line remotely, I'll do it. It's about building trust, not padding invoices."

NO LABELS, JUST RESULTS

Despite Climatisation ACG's success, the company still operates with unbranded trucks and no website — something Anthony plans to change with a complete rebrand later this year.

"When we started, the logo was just a stock image of two blue-collar workers," he says. "It served its purpose. But now that we're moving into the next phase of growth, we're ready to build a brand that reflects our values and our performance."

Such a lack of traditional marketing hasn't held them back. Word-of-mouth, social media, and community engagement keep Climatisation ACG booked out three to four weeks at a time.

Anthony says, "We've got no truck



wraps, no ads, and no search engine optimization (SEO). But we're swamped. The phones just don't stop ringing."

DISCOVERING NCI AND A NEW PATH FORWARD

Anthony's transformation into a High-Performance HVAC contractor started with a Google search.

"One of my techs suggested getting into indoor air quality (IAQ), so I started looking for the best indoor air quality trainer out there," he recalls. "That search led me to [John Ellis](#), and eventually to the National Comfort Institute (NCI) [Summit in 2024](#)."

Up to that point, Anthony says he didn't know what NCI was. But John Ellis was speaking at the Summit event, so he bought a ticket and attended.

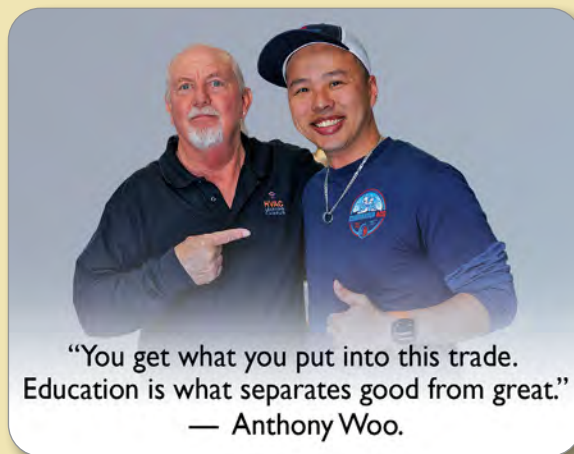
That changed everything for him. After attending his first Summit, he went all-in.

"I didn't even know what I was signing up for. I just wanted to hear John Ellis speak. But once I got there, I realized NCI wasn't just about training, it was about community."

In less than a year, Anthony com-

pleted every NCI certification except combustion (which requires licensing not available in Quebec). He has also ensured that his team receives training tailored to their roles.

"My installers went through duct optimization. My service technicians performed airflow balancing and system performance optimization. Everyone's specialized, and I've taken all the courses, so I know what each person is learning."



RED TAPE, REAL PROBLEMS

If operating a business in a highly competitive HVAC market is challenging, try doing it in Quebec, where language laws, licensing limitations, and import restrictions create constant roadblocks.

"We can't install disconnects because that's an electrician's job. We can't even run a drain hose into a wall without risking union complaints," Anthony explains.

Even obtaining the necessary tools for performance-based testing can be a nightmare.

"Most U.S. manufacturers won't ship to Quebec because of packaging laws requiring French-language labels. I had to order TrueFlow® Grids and capture hoods to a U.S. address in New York, then drive across the border to pick them up. I got flagged at customs for exceeding the \$2,500 personal import limit."

And yet, Anthony persists. "I might be the only contractor in Quebec running static pressure tests with TrueFlow Grids on every job. No one installs test ports here. My customers are shocked — in a good way — when I show them actual system data. It's not that they resist testing; they've just never seen it before."

BRINGING CONSISTENCY TO CHAOS

With growth came new challenges, mainly consistency. Anthony and KYT



Training is one of the foundations that keeps the team at Climatisation ACG on the cutting edge and has contributed to their incredible growth.

realized it was time to slow their expansion and focus on internal systems.

“We’ve doubled every year since we started. But now we’re pumping the brakes. It’s not about getting bigger — it’s about getting better,” Anthony says.

He’s working on implementing the [Entrepreneurial Operating System \(EOS\)](#), creating standardized workflows, and integrating platforms like measureQuick® to ensure every tech follows the same diagnostic and reporting process.

“Right now, four techs might take four different approaches to the same job. That’s not scalable. I want us all to work to the same standard. It’s about stability. I want every customer to get the same quality of service no matter who shows up.”

Anthony Woo has taken on the role of visionary and recently promoted one of his team members to implementer. “It’s a game-changer. For the first time, I feel like we’re building a machine, not just a business.”

EDUCATION: THE HEART OF THE OPERATION

Anthony credits much of Climatisation ACG’s success to his obsession

with education. He is a self-proclaimed ‘education junkie.’

“I’ve got a binder full of certificates. Fieldpiece, Daikin University, NCI, infrared diagnostics—you name it, I’ve taken it,” he says.

He even created what he calls “[University on Wheels](#),” after listening to [Bryan Orr’s HVAC School podcast](#) between service calls to keep sharp on the fundamentals. “Those

podcasts reminded me of the basics I’d forgotten and gave me new ways to think about problems.”

His advice to young techs? “You get what you put into this trade. You can do the bare minimum, or you can unlock a whole different level of success through learning.

Education is what allowed us to stay busy through the winter when we used to be slow. Now we’re doing duct renovations, IAQ work, and humidity control — all thanks to the knowledge we gained through NCI.”

THE POWER OF COMMUNITY

For Anthony, the biggest surprise about joining NCI wasn’t the certifications — it was the people.

“I sat down at a random table at my first Summit and met some of the most helpful, open-minded contractors I’ve ever known,” he says.

“In Quebec, the HVAC world is cut-throat. But at NCI, everyone shares —



Anthony Woo is a self-proclaimed ‘education junkie.’ Here he and an installer unload a non-ducted mini-split on one of their jobs.

everyone lifts each other up. At my first Summit, I met people who are now mentors.

“Now, when I run into a challenge, I can call on people from across the High-Performance HVAC Industry. It’s not just training. It’s a tribe.”

That network has been instrumental as Climatisation ACG refines its processes and prepares for its next stage. “I’m not even competing in my local market anymore. We’re doing things no one else in Quebec is doing. And NCI gave me the tools — and the people — to make that possible.”

LOOKING AHEAD

Anthony knows his company’s story is still being written. The rebrand is



“I might be the only HVAC contractor in Quebec running TrueFlow Grids and static pressure tests on every job.”
— Anthony Woo.

coming. The systems are being built. But the values — service, education, perseverance — are already firmly in place.

“We’re not rushing growth. We’re refining it. The next couple of years will focus on foundational processes, training, and brand identity. Yes,

we’re still a small team. But we’re punching way above our weight. And we’re doing it the right way.

“High performance isn’t a label. It’s a lifestyle. And we’re living it every day.”

His final message to contractors thinking about High-Performance HVAC: “Join NCI. Not just for the training, but for the people. Sit in a room with that kind of mindset, and you can’t help but level up.”

It is for these and so many other reasons that the team at *High-Performance HVAC Today* chose **Climatisation ACG** of Montreal in the province of Quebec, Canada, for this month’s *Contractor Spotlight*. Congratulations to Anthony Woo and his entire team. **NCI**

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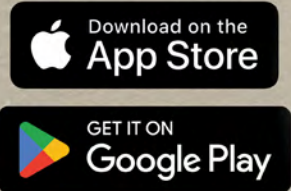
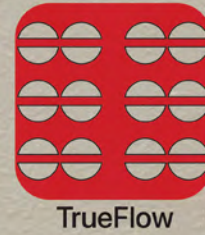
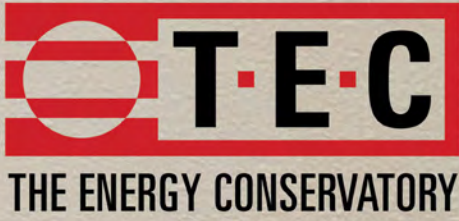
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Maintenance Agreements: *Transforming Our HVAC Business*

When we first launched our maintenance agreement program at [Hearn Plumbing, Heating, and Air](#), it looked a lot like everyone else's — simple checkups, basic service visits. This was a great way to smooth out our shoulder seasons. However, as we adopted High-Performance HVAC™, our maintenance agreements evolved into something completely different.

Today, they're more than a tool to fill the schedule — they're a cornerstone of how we build long-term relationships, train our team, and deliver real value to homeowners.

Here's how we arrived at our current position, and why we will never look back.

A SHIFT FROM STANDARD TO STRATEGIC

Like many contractors, we started with a traditional maintenance (membership) program. It provided us with recurring income and helped fill in the slower periods between heating and cooling seasons.

But once we began integrating high-performance testing into our work, that same program started to feel limited. We realized that if we were serious about [system performance](#), we had to take our memberships to the next level too.

The shift wasn't immediate. We didn't scrap the original program — we built on it. Every time we attended [High-Performance HVAC training](#) taught by National Comfort Institute (NCI), we'd come back and revise our inspection forms, integrating new tests or measurements we learned.

The result is a single, high-performance maintenance agreement that continues to evolve and deliver increasing value over time.

Think about how many HVAC companies are out there offering the same thing — tune-ups, clean coils, refrigerant checks. A high-performance plan makes you stand out. You're not selling a checklist, you're selling system optimization, performance tracking, and peace of mind.

The result: today, we don't have two separate maintenance programs. Our high-performance membership is how we do maintenance now.

REAL TESTING, REAL CONVERSATIONS

High-performance maintenance isn't just about checking a box. It's about thoroughly testing systems and using the data to educate homeowners.

Every visit includes detailed measurements, such as static pressure, temperature splits, and combustion analysis — you name it.

Our goal isn't just to service equipment; it's to provide exceptional service. Our mission is to help homeowners understand how their systems are performing. This approach is a win for the customer.

By the way, this approach is also a win for our technicians. Every time they touch a system — whether for maintenance, service, or installation — technicians must test and record data using either a short-form or full-form inspection. This consistency has built a culture of accountability and learning, where everyone on the team contributes to refining our approach.

BUILDING TRUST THROUGH TRANSPARENCY

One of the biggest benefits of our high-performance memberships is how they transform the customer conversation. Instead of



Maintenance and Service:

State: _____
 Phone Number: _____
 Provide service and maintenance to the [_____] of [_____] [Year] _____

selling from a position of opinion, we're showing hard data. We can prove where the system is under performing and explain what that means in practical terms.

This transparency helps build trust. Homeowners stop seeing us as “sales-people” and start viewing us as partners. We're no longer just telling them what we think — they can see for themselves through the visuals and tools we share with them.

We train our technicians to walk customers through the data, showing them what they're measuring and using analogies — from cars needing oil changes to the importance of regular doctor checkups — to explain why testing matters.

We also leave behind a professional trifold packet and a detailed system performance report generated through our ServiceTitan management software, so the conversation continues even after we leave.

HANDLING OBJECTIONS AND PRICING REALITIES

Here's the thing: most people assume our high-performance membership must be expensive. But it's not. At \$19.95/month, or around \$240/

year, our price is approachable. That was a strategic decision. We wanted to ensure that price wasn't a barrier so that the customer can focus on value instead.

We're upfront about what's included—and what's not. The fact is that we sell what the consumer receives, not the price. Our visits are inspections, not clean-and-checks. We don't clean blower wheels or provide filters as part of the membership. What we do provide is information: detailed system

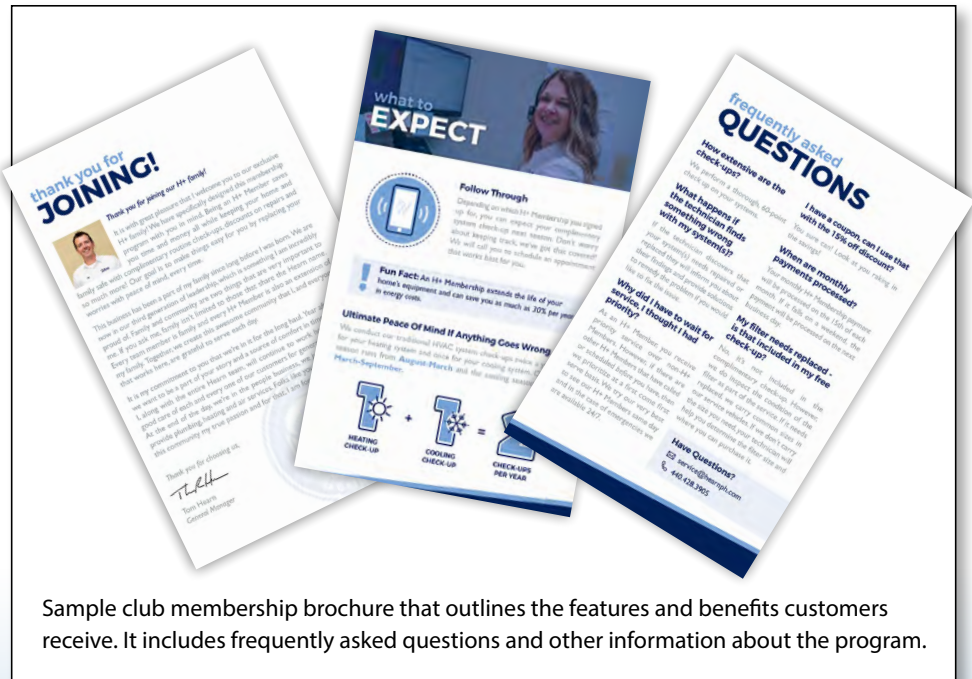
diagnostics that let homeowners decide what to address and when.

We sell peace of mind: fewer breakdowns, lower bills, safety, reliability, and comfort. We are proactive versus being reactive.

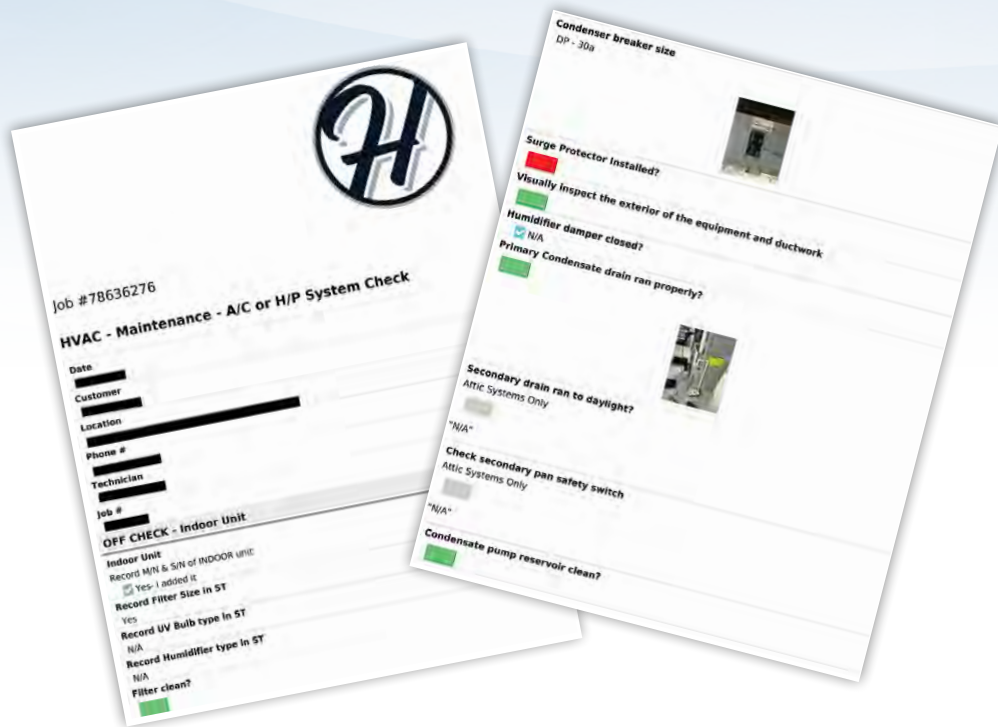
This approach works well for us. We don't get much pushback on price because the value is clear.

OPERATIONAL BENEFITS AND CUSTOMER LOYALTY

While high-performance testing



Sample club membership brochure that outlines the features and benefits customers receive. It includes frequently asked questions and other information about the program.



This is an example of the Hearn maintenance report they use to capture and present system data to share with customers.

enhances the customer’s experience, it also improves our internal operations. Memberships help us stabilize staffing year-round. In fact, we’ve never had to lay off an HVAC team member — there’s always work to be done.

My wife, Dennielle, is integral to this process. She developed a scheduling grid that prioritizes our members. We schedule their appointments two to three weeks in advance and intentionally leave space for emergency calls.

If we do need to reschedule a member, it only happens once, then that visit becomes non-negotiable. That process builds loyalty, and our customers recognize the care we take in following through on our commitments.

Again, proactive testing catches issues before they cause breakdowns. That means less emergency work, happier customers, and more efficient scheduling.

With that in mind, we also see the impact our call center can have on

customer relationships. We train our team to gather detailed scheduling preferences, helping us optimize routes and improve the customer experience. Everything is tracked and digitized through ServiceTitan, including testing history, equipment and duct photos, and our recommendations.

TRAINING AND TECHNICIAN BUY-IN

From day one, we train every technician in high-performance testing. That’s not just about system knowledge—it’s about effective communication. We train our team to understand what the numbers mean, how to explain them in homeowner-friendly terms, and how to create options that make sense.

What’s most exciting is the pride our techs take in their work. When they return from a visit and proudly show us the static pressure improvements or balancing results on their tablet,

we know it’s working. They feel empowered by the data and the impact they’re making — and they love it.

MAINTENANCE MEMBERSHIPS AS A TRAINING GROUND

One of the smartest things we did was turn every maintenance visit into a learning lab. We didn’t start selling [air upgrades](#) right away. Instead, each technician spends six to eight months systematically and thoroughly measuring. Over time, they become confident in both the process and the messaging.

We’re now considering adding another membership tier — one that is even more advanced — for homeowners who want maximum [system optimization](#) and protection.

However, even as it stands, our single membership level is exceeding our expectations.

ADVICE FOR OTHER CONTRACTORS

If you’re thinking about starting a high-performance maintenance program, don’t over complicate it. Start measuring. You don’t even have to explain what the numbers mean at first — just create the habit. Patterns will emerge.

You’ll start seeing recurring issues, such as undersized returns or poor airflow. Then you’ll be able to recommend meaningful improvements.

Even if you don’t have a membership program, it’s never too late to start one. Do the math. Take a look at your team and your schedule.

How many memberships can you realistically manage? Create a simple form. Schedule proactively. And most importantly, prioritize those customers. Build relationships. That’s what

turns one-time service calls into long-term loyalty.

FINAL THOUGHTS

High-performance maintenance agreements have transformed our business — not just financially, but culturally. They've helped us train better technicians, build stronger relationships, and deliver a higher standard of service.

Most importantly, they've helped us do right by our customers.

And finally, your techs benefit too:


- Better-maintained systems = happy customers
- Better-maintained systems = fewer emergency/after-hours visits
- Predictable visits
- Unified account history

- Customers are educated and loyal
- Less pressure to 'sell' because we build the value and education into the process
- Mitigate customer surprise with breakdowns
- Unified consistent process and checklist
- Consistent work.

It builds confidence and improves job satisfaction.

Memberships benefit your business, your team, and your customers. If you don't have a high-performance program, now's the time to put one together.

Start small. Build it out. Train your techs. And give customers the value and confidence they deserve. This approach may not be for everyone, but for

us, it's not just a business model — it's a commitment to excellence. 

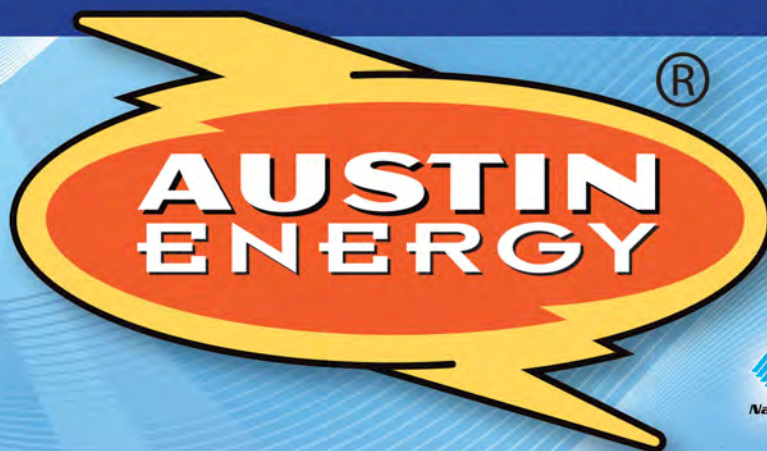
Tom Hearn is co-owner of [Hearn Plumbing, Heating & Air](#), a multi-generation family business committed to high-performance HVAC and customer-first service. If you have questions, he can be reached at ncilink.com/ContactMe.



Dennielle Hearn manages operations and customer experience at Hearn, with a special focus on training, scheduling, and ensuring membership loyalty. Together, they've

helped lead the company's evolution into a High-Performance HVAC provider known for transparency, data-driven service, and strong community relationships. Dennielle can be reached at ncilink.com/ContactMe.

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NCI 2025 High-Performance Summit: Navigating the PATH to Performance Expert Panel Discussions

This year, National Comfort Institute (NCI) 's High-Performance HVAC™ Summit will feature two panel discussions where industry professionals will address some of the key issues contractors face when implementing performance into their companies.

The first panel will address **How to Overcome HVAC System Redesign Challenges**. The fact is, redesigning an HVAC system in an existing home to optimize its performance has always been a challenge. Sometimes it feels like the house beats you. Or does it? In this panel discussion, five industry experts — ranging from High-Performance HVAC Contractors to System Design Specialists — will tackle the challenging problems contractors face in the field.

This panel will be moderated by NCI's Vice President of Training,

David Richardson, and includes the following professionals:

- **Alex Meaney**, President, Mean HVAC Consulting and Design
- **Dawn Mroczek**, General Manager, GV's Heating and Cooling
- **Ed Janowiak**, Manager, HVAC Design Education
- **Paul Wieboldt**, President, Tradewinds Appropriate Technologies.
- **Colin Walsh**, VP of Sales, Conduit Tech.

The second panel discussion addresses a topic very near and dear to most NCI-trained contractors: treating the house as the system. In this session, titled **Whole-Home Thinking: Uniting HVAC and Building Science**, four industry professionals will discuss how, from their perspectives, HVAC and building science not only overlap but are inseparable.

From energy efficiency to indoor air quality, the systems we install are shaped by the buildings they serve. That's why forward-thinking contractors are embracing a performance-first





mindset, using tools such as blower doors, load calculations, and duct diagnostics to pinpoint the root of comfort and efficiency issues.

In this second panel, you'll hear how top HVAC pros are integrating building science into their businesses — improving installations, reducing callbacks, and standing out in a crowded market.

This panel will be moderated by NCI's Ben Lipscomb, P.E., Director of Engineering

and Utility Programs. The panelists are:

- **Adam Mufich**, NCI instructor and curriculum developer
- **Mike Cianfrocco**, The HVAC Grapevine
- **Ty Branaman**, HVACR educator and content creator
- **Dustin Cole**, HVACR journeyman and chief disruptor of Cole Air.
- **Mitch Bailey**, President, Bailey's Heating & Air, Inc.

Overcoming Adversity Despite All Odds

This year, the team at NCI is pleased to announce that Contractor **Chuck Worley, President of Worley Home Services in Yorktown, VA**, will present the 2025 NCI Summit Keynote. He will share his rags-to-riches story, from growing up in the trades working for his father, to creating his own thriving company, and then suffering the devastating loss of that business.

However, his story extends far beyond this — it's a tale of redemption. From personal crossroads and financial ruin, he rose again, rebuilding a company, a reputation,

and repaying every penny he owed. His keynote isn't just about HVAC — it's about integrity, resilience, and starting over stronger than before.

Learn how he managed this incredible comeback, where his business is today, and how the lessons he learned can be applied to you, your family, and your High-Performance HVAC business. Oh, and discover why Chuck ALWAYS wears orange. This keynote is not to be missed.



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Total HVAC System Rating with ComfortMaxx™ & measureQuick®

One of the most significant challenges our industry faces is understanding the difference between HVAC equipment and the HVAC system. For example, many contractors and their customers believe the equipment and the system are the same. They assume a 95% furnace and 22 SEER condensing unit automatically perform at their rated efficiency once installed.

HVAC system rating and verification sheds new light on this assumption. Specifically, system rating and verification reveal contractor craftsmanship and installation conditions' influence on the installed HVAC system. So, let's look at what's involved in an HVAC system rating and how [ComfortMaxx™](#) with [measureQuick®](#) ties in.

THE IMPORTANCE OF HVAC SYSTEM RATINGS

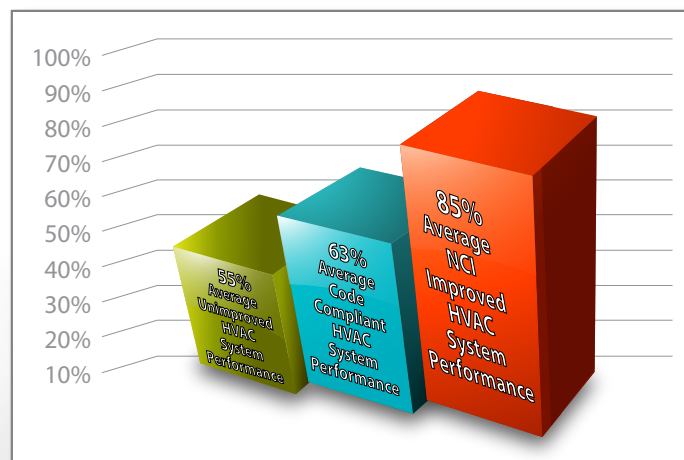
The HVAC industry is one of few specialized professions that designs and field assembles multiple mechanical components to create an HVAC system. This task is quite an undertaking since various people with different roles ensure everything works in unison.

To deliver what you promise and what your customer pays for, you need a way to rate your installations. In its simplest form, an HVAC system rating looks at the total heating or cooling Btus the HVAC system delivers into the living space. Then you compare them to the amount of Btus the equipment produces under tested conditions.

A rating considers all the variables, from proper design to the installation conditions. In other words, it looks past the laboratory-rated efficiency of the HVAC equipment. In this case, an HVAC system that achieves a rating over 90% is doing an exceptional job. But in some locations, like attics, that result is hard to achieve.

HVAC system ratings provide an HVAC system assurance policy. It gives your customers the confidence that the equipment they purchased operates as intended. In addition, it gives you a way to set yourself apart from your competition, which only focuses on the yellow labels and equipment laboratory ratings.

Adding software, such as ComfortMaxx in measureQuick®, provides third-party credibility so you can focus on results instead of assumptions. It is the craftsmanship litmus test that proves how well your HVAC systems perform.



EVERYONE IN YOUR COMPANY DETERMINES THE HVAC SYSTEM RATING

It takes everyone in an HVAC company to achieve an acceptable HVAC system rating. That is to say, no one person holds all responsibility. No one person can become a scapegoat.

To that end, HVAC system ratings start with company owners and management. If they don't decide it's essential to

ensure their installed systems work as designed, the steps to rate the system will never happen.

So here are some of the roles and responsibilities to consider:

Company leaders must instill system performance as a culture. No one else can do it. If they believe in the benefits and opportunities in rating system performance, then they can share the vision with everyone. From there, the concept catches on throughout the company.

Salespeople have an enormous responsibility in system performance ratings. They must know how to offer the right options, not just gather nameplate information from existing equipment and then quote the same-sized replacement. Their view must expand beyond the equipment and look at what it's attached to.

Installation crews determine how well the equipment performs. Their work influences system performance more than anyone else. For example, an excellent installation crew will get great results. Bad installations can't hide once you add system ratings to your jobs. It's the ultimate form of quality control.

Service and maintenance technicians discover conditions that lead to poor system performance and generate leads for the company to serve their customers better. That means they test, diagnose, and prescribe solutions for any hidden defects they uncover.

Without their hard work to discover poorly performing systems, there is no opportunity to solve long-standing customer issues. Problems remain hidden unless technicians make the defects visible through testing.

The office staff also needs to understand there is more to HVAC than just equipment. There are schedule tweaks to make and new services to offer that improve the way things are done. In addition, improving system performance and verifying it through ratings helps remove the seasonal nature of the HVAC Industry.

When the busy season slows down, there are always poorly performing duct systems needing help. The office staff can coordinate these jobs at slower times and keep everyone working throughout the year.

Your customers ultimately decide system performance ratings. If they ignore the necessary modifications you recommend, there's no way they can get the results they desire.

Therefore, customers decide how well they want their equipment to operate by confronting system issues that reduce design performance.

It's your responsibility to inform customers of problems. But it's their responsibility to make an informed decision once you provide the facts.

RESOURCES TO RATE TOTAL HVAC SYSTEM PERFORMANCE

Since delivered Btus are the heart of an HVAC system rating, you need resources to measure, compare against, and capture the information.

To that end, there are three resources you need to capture test results: test instruments, system documentation, and technology.



First, let's look at the test instruments necessary to rate system performance.

- **Manometer(s)** – to measure system static pressures
- **Air Balancing Hood** – to measure airflow from each supply register and return grille
- **Anemometer** (Thermal/Hot-wire/Rotating Vane) – to measure air velocity and calculate airflow from registers and grilles you cannot measure with a balancing hood
- **Wireless Psychrometer Probes** – to simultaneously check equipment, system temperature, and enthalpy change
- **Equipment specifications** – to compare your field measurements against. They are the baseline for your readings
- **Floor plan and duct schematic** – for a visual reference of the room's, system conditions, and the duct sizes attached to them.

● **Load Calculation or Estimated Room Airflow** – to provide airflow targets to compare individual supply airflow and Btu measurements against.

Finally, you need the right technology to capture test results.

● **A tablet or laptop with internet access** – to capture system information and measurements for ComfortMaxx

● **A ComfortMaxx subscription in measureQuick** – to automate the testing process, perform the HVAC system rating calculations, and generate reports without missing a step.

Once these resources are in place, you need to make sure the skills are also in place to correctly capture the information. Software is only as good as the data you put into it.

SKILLS YOU NEED TO RATE TOTAL HVAC SYSTEM PERFORMANCE

Now that you have a list of resources, you need to ensure your team has the essential skills. Before any testing begins, a certified technician must gather all the equipment and system information.

Much of that is equipment nameplate data that includes model numbers, airflow capacity, and maximum-rated TESP (**Total External Static Pressure**). Other information, such as fan speed settings and filter sizes, might not be accessible until the testing technician is on the job.

Many of these steps are automated with measureQuick simply by taking

photos of the equipment nameplates and system components.

In addition to gathering the correct information, the testing technician should be able to measure:

- Static pressure at the equipment
- Airflow from the equipment and system
- Temperature from the equipment and system.

Once the technician has these measurements, they must be able to interpret the readings to assure nothing is out of line or missed.



COMFORTMAXX HVAC SYSTEM RATING WITH MEASUREQUICK

The ComfortMaxx process is now built into measureQuick as a workflow. As you capture data into ComfortMaxx, measureQuick does the heavy lifting.

It walks you through the testing process, gathers data from connect-

ed smart instruments, and provides all calculations.

This is how you can automate and simplify HVAC system performance rating according to NCI testing principles.

ComfortMaxx collects the following:

● **Customer information** – a permanent geo-tagged record in the cloud of your customers' HVAC system information

● **Location information** – matches equipment and systems to specific locations in a home with more than one HVAC system. Simply drag the pointer to the right spot. You can rate each system for each location

● **System information** – keeps a record of past testing as a comparison for future measurements to assure the system remains operating in the best possible condition

● **Test results and calculations** – static pressure, airflow, temperature, and Btus are captured and compared to equipment and system specifications to create a final rating of the installed HVAC system independent of the HVAC equipment rating. The reports are visual and easy to understand for both the customer and contractor.

The great thing about an HVAC system rating is it's something *only your company can provide*. It isn't a cookie-cutter rating.

You can't just check the boxes on a list, and the system passes. Instead, it's connected to the craftsmanship and skills you bring to the job.

Unless your competitors do their

work exactly like you, they can't repeat the results.

CHALLENGES AND OBSTACLES TO OVERCOME

Learning anything new usually comes with its difficulties. HVAC system rating is no different. Change almost always comes with resistance.

If you're considering adding HVAC system ratings to your service offerings, think about where you're going and how you want to get there. Most people plan vacations months in advance. You're planning to improve how you do business, so give it some thought and preparation.

Directions from a map are essential to a vacation. As you add HVAC system ratings, you also need a MAP.

Each letter of MAP means something you should think about as you plan this commitment.


Motivation – why I should care and do this? Know the reason why

Awareness – what will this affect and what results to expect? Understand the benefits or consequences

Plans – what to do about it and how to do it? Decide on action steps.

Once your team understands your motivation behind rating system performance and is aware of the benefits, they can help you lay out the necessary plans and become part of the movement instead of holding back progress.

Use the MAP concept to help you determine a destination and understand that you will need to detour occasionally to get around an unexpected

obstacle or challenge. If you encounter them, that's a good sign you're moving in the right direction. If providing real HVAC system performance results was easy, everyone would do it. Only the elite have what it takes to move ahead of the industry. 



David Richardson joined National Comfort Institute full time in 2010 as a curriculum developer and trainer. In this role, he develops and teaches practical, real-world training focused on the HVAC and Home Performance industries. He is currently NCI's vice president of curriculum development. He has been involved in the High-Performance HVAC industry since 2001. David writes monthly columns for various industry publications and is a regular presenter at many industry conferences. He can be reached at the following URL: ncilink.com/ContactMe.

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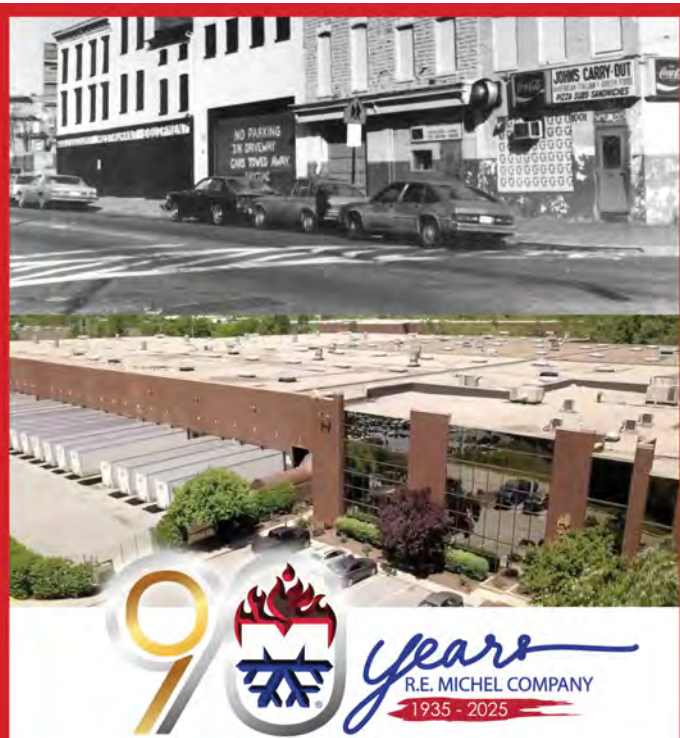


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10 Steps to Solving Common Inverter Problems

If you're like me, your journey with inverter-driven systems started with a mix of curiosity, confusion, and maybe a little frustration. These systems are powerful, efficient, and sometimes downright unpredictable.

They promise all the efficiency in the world, incredible comfort, and ultra-quiet operation. But they can also leave techs scratching their heads, wasting time, and burning refrigerant (and money) if we don't handle them right.

Over the years — through testing, missteps, and lots of conversations with technicians and trainers across the country — I've picked up a few things that might save you some grief.

So here are 10 key lessons about inverters I've learned as a contractor, trainer, and fellow tech. These aren't abstract theories—this is real-world stuff you can use tomorrow.

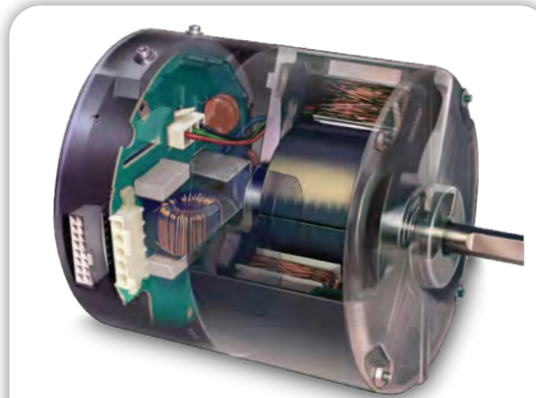
INVERTER DOESN'T MEAN ONLY ONE THING

People often ask me to explain “how inverters work.” But [there's no one-size-fits-all answer](#) because “inverter-driven” equipment comes in all shapes and flavors. There are true variable frequency driven drives like what you find in commercial applications where you're using normal three-phase motor-driven VFDs. On the other hand, you have brushless DC versions that use permanent

magnet motors. These are different, they behave differently, and require different troubleshooting approaches.

By the way, an ECM blower is technically an inverter-driven motor. So is a ductless mini-split. But the way they operate, respond, and fail can be completely different.

What matters is understanding that inverters control motor speed by converting AC power to DC and then back again to mimic variable-frequency AC. That's the gist. But manufacturers rarely tell us exactly how they implement their control strategies, so don't expect to know everything going in.



Ever since Nikola Tesla invented the modern induction motor, we have been struggling with varying the speed of motors efficiently and reliably. The trouble in the HVAC industry is that there are several different types of technologies in play, and they can easily get confused. *Image courtesy of HVAC School.*

COMPRESSION RATIO STILL MATTERS

When it comes to inverter performance, compression ratio (head pressure divided by suction pressure) is a big deal. Airflow, in both cooling and heating modes, is a big part of heat pump compression ratios. For example, in heat mode, if the outdoor unit has bushes around it, that can drive down evaporator

temperature, which will drive up the compression ratio.

If the heat pump condenser is inside the home and there isn't enough airflow in heat mode, that can also result in higher compression ratios.

A high ratio equals inefficiency. But here's the rub: sometimes we need high compression ratios.



There is a steady-state voltage problem that can take out inverter boards. Inverter-driven equipment refers to a variable-frequency drive with ECM compressors and fans that can be damaged by power outages. *Image courtesy of HVAC School.*

If you're wringing moisture out of a humid Florida home or trying to keep someone warm in Minneapolis at -5°F, you're deliberately increasing the compression ratio to get results.

In those cases, we're not optimizing for energy. We're optimizing for comfort. And that's okay. Comfort is the goal. Be sure to select equipment and airflow strategies that support the capacity needs without overworking the compressor.

Another thought to consider: [inverters are really sensitive to power surges](#) which, in my opinion, requires providing high quality surge protection or continuous over-voltage protection.

At Kalos, we've started providing these products for our customers.

INSTALLATION DETAILS MAKE OR BREAK PERFORMANCE

Start by reading the manual (Yes, really) before you touch a tool. Read the manufacturer's installation and service instructions. And here's the thing — don't just tell your installers to read it. You read it, then interpret it for them. Show them. Spell it out.

Your techs aren't lazy, they're over-

whelmed. Set them up for success with diagrams, geotagged photos, and job-specific checklists. That goes for charging modes, wiring protocols, and line set limits.

Most inverter problems I've seen come down to four issues:

- ◆ Improper wiring
- ◆ Poor control protection
- ◆ Bad charging
- ◆ Incorrect airflow.

If you don't hit those four, you're going to run into issues. For example, control boards are voltage sensitive. If you're feeding 240V into a system tapped for 208V, you're setting it up to fail.

And don't get me started on grounding and shielding — if you're not terminating that stuff correctly, get ready for a ghost hunt when intermittent faults start appearing.

INVERTERS DON'T SOLVE DUCT PROBLEMS

One of the worst things you can do is drop an ECM blower or inverter system onto inadequate ductwork and expect it to fix airflow. That's a recipe for blower wheels flying apart and humidity complaints.

I've heard too many customers say, "Ever since you installed that fancy new system, my house feels damp." They're not crazy. Dehumidification depends on long runtimes and cold evaporator temperatures. If you run the blower too fast or don't stage capacity properly, you're going to miss your moisture targets — even with all the best gear in the world.

So, you need to pay attention to airflow and duct design. Inverters are load-matching machines — they'll spin up or down to meet demand. But if they're fighting terrible ductwork, you're going to see poor dehumidification, premature failures, and disappointed clients.

Don't try to fix bad ducts with smart compressors. It doesn't work.

KNOW WHEN TO MOUNT, WHERE TO MOUNT

If you're in a cold climate and using a cold-climate heat pump, get that unit up off the ground — but *don't* mount it to the side of a house. When it ramps up in heating mode, it can resonate and vibrate like a banshee. In Florida? Not a big deal. In Boston? Be ready for some awkward callbacks.

I prefer using ground stands and maintaining a bit of distance between the unit and the building. It's a cleaner installation, runs quieter, and is often easier to service.

Be sure to commission every system. Make that part of your process, not an optional add-on.

SCALES AREN'T OPTIONAL

Look, I used to think I had a “calibrated elbow.” I could guess within half a pound how much refrigerant I added. Turns out I was wrong. If you're not weighing in your charge — especially with inverter and ductless systems — you're flying blind. Suction pressure tells you almost nothing with these units.

Make it standard to photograph the weight before and after. This action is vital for ductless and inverter systems with accumulators. Charge slowly, let the system stabilize, and understand that inverter systems often have longer adjustment periods. Impatience leads to overcharging — I've done it, and you probably have too.

Today, we use a geotagged scale as part of our commissioning workflow. Not because we don't trust our team, but because accountability builds consistency.

WHEN IN DOUBT, WEIGH IT OUT

This one's simple. If you're unsure of the charge, weigh it out. Don't guess. Don't rely on pressures or line temperatures alone. Especially on ductless multi-head systems, it's shockingly

easy to overcharge if you're still hunting suction pressure like it was 1999.

We had one tech add 20 lbs. of extra 410A into a system because he didn't understand what the numbers were telling him. That's a *very* expensive mistake. Taking 10 minutes to train that tech could have avoided it.

VACUUM AND NITROGEN ARE NON-NEGOTIABLE

I don't care what your old-timer installer says. Today's POE oils are solvents — they strip oxides off the inside of the tubing and send them downstream. If you're not flowing nitrogen while brazing, you're going to foul up screens and metering devices, especially in inverter systems with fine control logic.

And no, you don't need a fancy nitrogen regulator. Teach your crew how to use a standard T-handle to get just a whisper of flow. Give them the tools and the training. Same for vacuum. Get below 500 microns and verify with a clean micron gauge. If your team says they “ran out of batteries,” just nod and hand them a new pack. No judgment. Just fix the process.

DON'T BLAME THE TECH — FIX THE PROCESS

Most installation errors aren't about laziness — they're about missing steps, poor setup, or vague expectations. You can't tell a tech, “Just follow the manual,” if *you* didn't read the manual first. If your guy wired the base pan heater wrong, that's not all on him — it's on the person who failed to build a system-specific checklist.

At Kalos, we're leaning more into job-specific protocols. Not just checklists — actual install strategies built for

that model, *that* application. Yes, it takes time up front. But the fewer callbacks, the fewer sleepless nights.

THIS STUFF IS SUPPOSED TO BE HARD — BUT IT'S WORTH IT

Here's the deal: Inverter systems are smarter than we are. They adapt, shift, and respond to things we can't even see unless we're measuring total system performance. But the thing is, they're only as good as the installation, the charge, and the airflow.

That's why High-Performance HVAC™ isn't just a buzzword. It's a philosophy. You don't throw in a 30 SEER system and call it a day.

You match the load, test your ductwork, verify Delta Ts, measure static, weigh the charge, document every step, and then come back six months later to re-test. Why? Getting it right is the point.



When it comes to avoiding inverter system issues, you really need to pay attention to airflow. **Graphic above courtesy of HVAC School.**

And here's the best part: when you do all of that, your inverter systems will *sing*. They'll heat better. Dehumidify better. Run quieter. Use less energy. And your *customers will notice the difference*.

Inverter systems are becoming the new normal. They require a new level of discipline.

FINAL THOUGHTS

I cannot emphasize this final point enough: **Be sure to commission every system.** Make that part of your process, not an optional add-on.

If you install a high-end inverter system in the winter, plan to come back when cooling season hits and re-test it.

Run through the manufacturer's test modes. Use every tool at your disposal to confirm charge, airflow, temperatures, and static pressure.

Performance testing isn't just for show — it protects your installations and builds trust with your customers.

Inverter systems aren't going anywhere. If anything, they're becoming the new normal in both residential and light commercial work. But they demand a new level of discipline.

That means no more "good enough." No more "elbow charging." No more "ductwork as an afterthought."

So, take the time. Build your process. Read the manual. Use your

scale. Flow your nitrogen. Take those photos. And when you're not sure, ask for help.

None of us is getting an electrical engineering degree anytime soon, but we can all get better every day. That's the fun part. That's why we're here.

Keep pushing. Keep testing. And as always, measure what matters. **NCI**



Bryan Orr is the founder of **HVAC School** and co-owner of **Kalos Services**, a high-performance HVAC contracting business in Central Florida. He writes, podcasts, and teaches techs how to

do things the right way — even when it's harder. For more information or if you have questions, you can reach Bryan at ncilink.com/ContactMe.

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September 16-18: Sacramento, CA
September 23-25: Eagan, MN
September 23-25: Valley View, OH
September 30 - October 2: Lakewood, NJ
October 7-9: Lawnside, NJ
October 14-16: Glen Burnie, MD
October 14-16: San Antonio, TX
October 21-23: Johnstown, CO
October 28-30: Canton, OH

Residential HVAC System Performance and Air Balancing

August 12-14: Lewisville, TX
August 19-21: Mentor, OH
September 16-18: White Plains, NY
September 30 - October 2: Somerville, MA
October 21-23: Tampa, FL

Airflow Testing & Diagnostics

September 16: Austin, TX

Commercial Air Balancing

August 19-21: Glen Burnie, MD
September 16-18: Roswell, GA
October 14-16: Monroeville, PA



PUBLIC LIVE TRAINING (cont.)

Duct System Optimization and Residential Air Balancing

August 26-28: Johnstown, CO
September 23-25: Richmond, VA
September 23-25: San Antonio, TX
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Airflow Testing & Diagnostics

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Commercial System Performance

September 23-24: Anaheim, CA

Duct System Optimization and Residential Air Balancing

October 1-3: Anaheim, CA

Combustion Performance and Carbon Monoxide Safety

October 7-9: Anaheim, CA

Residential HVAC System Performance

October 14-15: Anaheim, CA

High-Performance Heat Pump Retrofits

October 16: Anaheim, CA

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PODCAST OF THE MONTH: ComfortMaxx™

When National Comfort Institute (NCI) and the team at [measureQuick®](#) joined forces to evolve the [ComfortMaxx™](#) testing and diagnosing workflows into the measureQuick testing app, they knew there would a lot of work to be done.

When that part of the project was completed, it was time for the NCI team to test this new app in the field.

NCI Instructor Adam Mufich and **NCI VP of Training David Richardson** share the lessons they learned field testing *ComfortMaxx powered by measureQuick* in this new podcast.

They discuss testing challenges, like fan airflow measurement, zoned systems, the importance of processes and checklist, and why you should label your smart probes.

Their discoveries highlight the differences between the HVAC equipment and the total system and how the oversized equipment performed like it was the right size.

Listen to them discuss what those field tests were like, why they believe the results will speak for themselves, and how this next evolution in ComfortMaxx will benefit High-Performance HVAC contractors everywhere.

If you want to learn more, be sure to click this link — ncilink.com/CMPodcast – and listen to this important podcast.

NCI Summit Podcasting Returns

Back by popular demand, podcasting is returning to this year's Summit with some of the top industry influencers of High-Performance HVAC™.

During the Summit event, attendees will witness live interviews by HVAC professionals and NCI instructors who will discuss key industry issues and more. The beauty is you can see it live while it is happening.



More good news: For the first time, this year's Summit will also feature live-streaming of top event moments. This means you can gain valuable

insights from snippets of live-streamed sessions along with candid conversations with Summit attendees.

Join your fellow High-Performance HVAC contractors in Austin, from September 9-12 for one of the only HVAC Industry event focused on performance.

Learn more about Summit at GoToSummit.com. Or call **800/633-7058** for more information.



The Evolution of ComfortMaxx™

If you are already using ComfortMaxx, the good news is that it has evolved and changed. What that means is that the ComfortMaxx workflows are now part of the [measureQuick®](#) app.

If you are an NCI Member, you get the ComfortMaxx upgrade for **FREE!** In fact, members can add users to the ComfortMaxx Upgrade at no additional cost.

Non-members also have access to ComfortMaxx, powered by measureQuick. If you are unfamiliar, this is a next-level commissioning, diagnostic, and lead generation tool.

By the way, NCI will continue working with the measureQuick team to add new features and abilities to ComfortMaxx regularly.

For more information, call the NCI Customer Care line at **800/633-7058**. **NCI**



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10 Ways to Make the Most of Summit 2025



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.

NCI's **High-Performance HVAC™ Summit** in Austin, TX is just around the corner. With a little planning you can truly maximize your investment in this year's conference. Remember, Summit is the only event in our industry specifically tailored to help you grow your High-Performance HVAC business.

Here are 10 tips for getting the most out of the 2025 Summit this September 9-12th:

1. Plan your schedule to prioritize the breakout sessions you don't want to miss. There are eight breakout time slots and 14 different sessions. Each unique session is available twice, and **PerformanceTown** takes place six times.

This means you'll have an opportunity to participate in eight of the 14 sessions. The key is to create your schedule so you can hit all of your choices. Once the **Summit Mobile App** is released, you can plan directly on the App.

2. Bring at least one other team member so you can have someone in every breakout. With two or more, your team will have the benefit of participating in every session!

3. Connect with one of the many informal groups. Take advantage of in-between time to network with other contractors — you'll find them very open and welcoming. Each year Summit is attended by people at different levels of high-performance implementation.

4. Download the App. Our Summit App will be up soon. Everyone registered will receive a link in your email. The app will help you set up and track your Summit schedule. Also, many of the breakouts will include polls, and allow you to add your notes to the presentations right in the app!

5. Attend all sessions — Veteran participants don't skip any part of this value-packed event. Summit is not a vacation, although you can plan time off with your family before and after Summit

and enjoy the Kalahari Resort at our low conference rate — be sure to book ahead!

6. If you are new to Summit or NCI, seek out people with "Mentor" ribbons. They would be glad to take you under their wing. A mentor can be a great help and guide, both during and after Summit.

7. Be sure to sit in the on the two General Session Panels featuring industry icons and experts. The first, at 8:15 AM on Thursday, September 11th is on HVAC System Redesign. The second, at 8:45 AM on Friday will discuss the connection between Home Performance and HVAC.


8. Nominate someone for a scholarship. NCI is giving away **10 Summit Scholarships** worth roughly \$2,000 each. The scholarships include three nights stay at the Kalahari resort and full Summit registration! Scholarship winners will be recognized on stage.

9. Participate in PerformanceTown, an interactive hands-on experience. One station focuses on *Measured Performance* using NCI's **Comfort-Maxx™ on the measureQuick® platform.** Then you'll perform airflow diagnostics with NCI's **AirMaxx™** program and **TEC's Trueflow Grid.**

10. Visit with our industry partners throughout the conference and during trade show hours to learn about the latest products and technology.

This year's lineup features HVAC equipment and test instrument manufacturers, distributors, software companies, and other several key service providers.

If you follow the 10 pointers above you will assuredly get much more from Summit than just showing up and playing it by ear.

You will maximize your chances of finding many golden nuggets that will help your business thrive through 2025 and beyond! 





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