

HIGH-PERFORMANCE HVAC TODAY™

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

SUMMIT 2022

THIS TIME IT'S PERSONAL!

March 27 - 31 • Scottsdale, AZ

ALSO IN THIS ISSUE:

- Education Is Key to High-Performance Success
- Avoid The Top 10 Btu Measurement Mistakes
- 2022 Commercial Market Forecast



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THE
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RESULTS

10

COVER STORY:

This Time It's Personal: High-Performance HVAC Summit 2022

For the first time in two years, the High-Performance HVAC Industry gathers in-person. This year it's in Scottsdale, AZ. Here are the details.



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TRAINING:

Education is Key to High-Performance Success

David Holt explains what tools High-Performance contractors have to educate customers and how to use them.

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TECHNICAL:

How to Avoid the Top 10 Btu Measurement Mistakes

Based on his presentation at Summit 2022, Rob Falke shows you how to avoid Btu measurement mistakes.

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MANAGEMENT:

Commercial Market Forecast: Infrastructure, Inflation, and Insights

What does 2022 have in store for the commercial HVAC marketplace? Jackie Greene of ITR Economics provides some insights.

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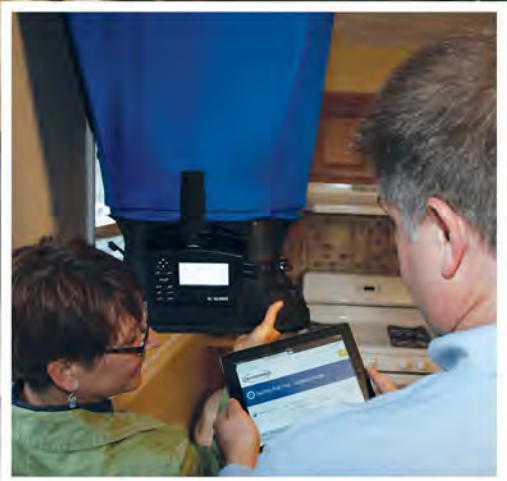
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Take the First Step Towards High Performance

Duct System Optimization & Residential Air Balancing Certification Training

Learn how to deliver high quality, profitable duct system renovations that really work! Set yourself apart from competitors by knowing how to optimize a duct system so it delivers the heating and cooling the equipment was designed to provide.

Uncover air distribution upgrade opportunities to offer the highest quality, comfort, and performance your customers want and are willing to pay for.



Upcoming Training in your area:

February 8-10: Centennial, CO

February 14-16: Orlando, FL

February 15-17: Lansing, MI

March 1-3: Glen Burnie, MD



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For more information, go to ncilink.com/DSO or call 800.633.7058

In-Person Training Remains a Good Bet

As you read this, the 2022 in-person event season is underway. The International AHR Expo is in the books, and most of the key organizations in the HVAC Industry are preparing for their live tradeshow and conference events.

National Comfort Institute's (NCI) High-Performance HVAC Summit is one of them. Summit will be live in Scottsdale, AZ at the We-Ko-Pa Resort and Casino for the first time in two years. This event happens March 27-31, 2022. We provide all the details on Summit on page 11.

NOTHING REINVIGORATES BETTER THAN BEING AMONG PEERS, SHARING STORIES, AND LEARNING FROM EACH OTHER AT INDUSTRY EVENTS.

BE SAFE OUT THERE

As the industry makes solid moves back to in-person events, several items should be on your radar regarding travel and safety.

First, travel issues remain with us thanks to the pandemic, weather, worker shortages, and so on. Rest assured, these things WILL impact your plans as you head out to attend live events. The key to success here is patience.

Your best bet is planning ahead, being prepared, and being patient.

After reaching your destination, you still must be careful. It's only natural as you attend tradeshow and conferences that you are in close proximity to people, shaking hands, making connections, gathering in small groups, dining, and so on.

This is the heartbeat of in-person events. An old trade press editor friend once told me I should travel with hand sanitizer and use it all the time at events like these. It wasn't a bad idea then, and it is even better today.

I guess the bottom line is to be smart. Realize that we are not yet back to a pre-pandemic normal and be safe.

HIT THE ROAD: YOU'LL BE GLAD YOU DID!

The time is at hand to get out there. Every contractor in the HVAC industry deserves to escape the day-to-day grind and attend industry events to recharge and renew.

Nothing reinvigorates better than being among peers, sharing stories, helping each other, and learning from one another.


Furthermore, attending in-person conferences and educational sessions brings you up to speed on the latest innovations and advances in

technology, business practices, and for High-Performance HVAC contractors, hands-on training with some of the industry's best.

For example, two of the articles in this issue, by **Rob Falke** and **David Holt**, are based on presentations at this year's NCI Summit. Rob teaches you about the most common Btu measurement mistakes and how to avoid them in his article appearing on page 19 of this issue.

David addresses the importance of educating and communicating with customers as you test and measure their entire HVAC systems. Read about it on page 7.

These are just two of the 18 sessions at Summit 2022.

The bottom line is that in-person training remains not only a good bet but an essential one. Don't let the travel and safety concerns prevent you from taking advantage of these in-person events and training opportunities. And we hope to see you in Scottsdale! 



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

TSI / Alnor 801 Rotating Vane Anemometer

When you encounter a grille, register, or diffuser that you can't measure with a balancing hood, the **TSI/Alnor 801 rotating vane anemometer (RVA)** is the quickest and easiest way to take your readings. The 801 RVA is also a great, compact instrument you can use to measure outside air intakes on rooftop package units, because it is very tolerant of windy conditions.

The TSI/Alnor 801 RVA measures air velocity, air volume, and temperature using a simple button and trigger operation. It will display readings in metric or imperial mode from 50 to 6000 feet per minute (fpm) or 0.25 to 30 meters per second (m/s). You can also program the instru-

ment to read airflow in cubic feet per minute (cfm). It has a timed average feature that allows you to measure multiple readings over a large opening and then convert to a single, averaged value.

The TSI/Alnor 801 RVA comes with a four-inch vane that allows for a larger measurement area. The head also rotates, so the display always faces you whether you're measuring supply or return/exhaust airflow.

The instrument needs sufficient velocity for the vanes to spin at a consistent rate, so it is not a good choice when there is low air velocity.

The 801 RVA comes with an optional cone kit that is perfect for small supply or exhaust grilles up to 200 CFM. It also comes with a NIST-Traceable Calibration certificate.

For more information, visit the **National Comfort Institute** store at ncilink.com/801RVA.

Note: TSI/Alnor also makes similar models that are detachable and work with the **TSI/Alnor VelocityCalc** (ncilink.com/tsi9565) multi-function ventilation meter, providing additional flexibility. **NCI**

— by David Richardson,
NCI Director of Technical Curriculum.



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Education is Key to High-Performance Success

Why does every visit to the doctor include measuring and recording your body weight, temperature, blood pressure, pulse, and respiration rate? It's quite simple. Medical doctors rely on accurate vital-sign measurements to determine the health of patients.

You'd question a doctor's approach if they didn't perform vital-sign measurements on each visit, wouldn't you?

There are essential clues in the current vital-sign measurements, with more insight gained as doctors consider trends over time. They cannot properly diagnose problems and prescribe the appropriate treatment without this information.

HVAC professionals use the same approach.

Important HVAC system performance vital-sign measurements include ambient carbon monoxide, static pressure, fan airflow, and temperature, to name a few. Did you notice that refrigerant pressure isn't on that list? What good is checking refrigerant pressure if fan airflow is way off?

High-Performance HVAC craftsmen rely on accurate measurements, not guesswork, to make their recommendations.

The key to successfully using this high-performance approach is to effectively "translate" numbers into understandable explanations that are

meaningful and important to the customer.

WHERE TO START?

As an HVAC professional, correctly measuring and understanding Total External Static Pressure (TESP) provides clues as to why a customer's heating and cooling system is not operating as well as it should.

Poor airflow resulting from excessive static pressure at the fan can result in uncomfortable rooms and inefficient operation. Identifying and solving static pressure issues leads to happier customers and profitable sales.

Measuring and recording static pressure on every call involving a ducted HVAC system should not be optional. What if your doctor said, "we are too busy right now to check your temperature and pulse..." Would you get up and leave? HVAC system static pressure measurement is just as important and shouldn't be kicked to the curb just because you are "too busy."

When correctly interpreted, static pressure measurements help you efficiently evaluate comfort distribution (duct) system performance and uncover hidden problems that "guessers" consistently miss.

So, where do you start? Begin by having the right mindset, acquiring the proper toolset, and developing the appropriate skillset.

MINDSET + TOOLSET + SKILLSET PRINCIPLES

True professionals in every sphere of life strive to be better tomorrow than they are today. Career advancement occurs when you consistently



Every doctor visit includes the gathering of vital sign measurements. This should also be true on HVAC calls.

apply your mindset, toolset, and skillset to achieve better future results. Every improvement starts in your mind.

Use the following mindset principles as a guide while pursuing your role as a High-Performance HVAC craftsman:

- Self-improvement through lifelong learning
- Respecting others, always
- Honesty, integrity, and trustworthiness
- Preparing well for every challenge
- Solutions based on measurements, not guesses
- Proving promises by measuring performance
- Dedicated to mastering high-performance HVAC.

Adopt these important principles to stand out from the tradesmen crowd. Instead of just “making eight,” you will make a real difference in your life and everyone who depends on you.

THE RIGHT TOOL FOR THE JOB

With HVAC components becoming more specialized, having the proper tool at hand for a given service has never been more critical. To prove your commitment to craftsmanship, you must select the right tool, use it correctly, and take pride in proper maintenance and reliability practices.

To professionally inform your customers about the condition of their existing comfort distribution system, your “static pressure education tool-kit” must include:

Static Pressure Test Kit:

- Magnehelic®/Manometer
- Static Pressure Tip
- Rubber Hose
- Drill, 3/8" Bullet-Point Drill Bit, and Drill Bit Sheath

THE
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RESULTS

simplify the customer education process.

NCI Home Comfort Report Flyers: NCI's Home Comfort Report series (ncilink.com/iNCI) is available to all members as downloads from the member website. These handy tools help your customers understand the benefits of static pressure testing, proper airflow, duct renovations, air balancing, etc.

Here are four ways that high-performance contractors use these important tools:

1. Print and laminate to use during discussions with customers
2. Print and leave with (or mail to) the customer to share with others
3. Store flyers on your tablet for easy retrieval and review
4. Email PDFs to customers or post links on your website.

“Important Test Results” Mailing: When you want to time-shift the follow-up on high static pressure opportunities, you can use the “Important Test Results” approach. To receive a copy of this robust procedure and a sample letter, attend **Summit 2022** or request a copy by emailing coach-ing@ncihvac.com.

DEVELOP A HIGH-PERFORMANCE TECHNICAL SKILLSET

Having the right mindset and toolset is worthless unless you know how to put them to work to educate and benefit your customer. Your skills determine your ability to successfully execute plans, processes, and procedures consistently and predictably.

Skillset development is the process of mastering required skills. The

- NCI Static Pressure Test Location diagrams
- (2) 3/8" Test Port Plugs
- (2) Static Pressure Port Stickers
- AirMaxx Lite™ Form.

AirMaxx Lite™ Mobile Application: Yes, there is an app for your mobile devices. AirMaxx Lite is free in your app store of choice and provides you with a digital way to capture your measurement results. You can then use the results to help educate your customer.

Here is what you'll need:

- Android or iOS Smartphone and/or Tablet
- AirMaxxLite.com (to learn more about this tool)
- AirMaxx Lite™ Mobile App (download from the [Google Play](https://play.google.com/store/apps/details?id=com.nci.hvac.AirMaxxLite) or [Apple App Store](https://apps.apple.com/us/app/airmaxx-lite/id1444444444)).

As a High-Performance HVAC craftsman, you must commit to equipping your entire technical team with a complete Static Pressure Test Kit and the AirMaxx Lite™ app on their smart device. Commit to a due date and make it happen because you can't guess; you must measure!

Customer Education Toolset:

In addition to the technical tools required to measure static pressure and perform fan airflow and total external static pressure calculations, High-Performance HVAC craftsmen use third-party resources to back up their claims and

successful use of AirMaxx Lite™, a tool designed to help you effectively communicate the condition of your customer's HVAC system, requires mastery of these basic skills:

Evaluate & Record HVAC Equipment Information:

- System Type
- Condenser Size
- Fan Capacity
- Fan Rated Static Pressure
- Fan Type and Speed Setting
- Mechanical Condition
- Cleanliness (Filter, Blower, Coils).

Install Static Pressure Test Ports (as needed):

- 3/8" hole properly installed on both sides of the blower.

Measure/Record Static Pressures:

- Static Pressure Tip pointing against the airflow
- Install/Reinstall Test Port Plugs.

Enter Accurate Data into AirMaxx Lite™:

- System Profile
- Static Pressures.

Evaluate AirMaxx Lite™ Reporting:

- Fan Airflow
- Total External Static Pressure.

Educate Customer by Sharing Findings:

- Display Graphs
- View Details
- Share the "Static Pressure" flyer.

Recommend Appropriate "Next Steps":

- Air Upgrade
- Distribution System Renovation.

None of the above-mentioned tasks requires years of experience; they are basic skills that must be learned and executed on every call that involves a ducted HVAC system. Consistently

performing these basic diagnostic skills using AirMaxx Lite™ will increase confidence in yourself and your recommendations.

BUILD CUSTOMER CONFIDENCE

Customers must be confident that they're making the right decision when they agree to trade their hard-earned money for your products and services.

Unfortunately, many customers lose confidence in contractors because of poor workmanship and broken promises. They've heard things like *"you will save 40% on your power bill,"* or *"this air filter will eliminate 95% of your dust,"* or *"your high-limit switch is bad,"* to name a few. Rarely are these promises delivered.

Customer confidence quickly erodes after experiencing the frustration of a technician tackling a job with parts-swapping guesswork. There's no reason to resort to such measures with today's high-tech systems and tools. High-quality precision instruments can pinpoint the problem and lead you to the proper corrective action.

Having the right tools and training lets your customers know that your shop can tackle any mechanical issue they may have.


PROVE YOUR PROMISES

When you apply the principles discussed in this article, you can overcome many obstacles standing in the way of a more profitable and enjoyable business. By proving what you promise through proper measurements, your customers and your entire team gain greater confidence in working together.

This high-performance approach builds confidence in customers because the technicians, comfort advisors, and installers have confidence in their ability to identify and rectify real problems consistently – and it shows! Everyone is happier when you do the job right the first time.

A referral-based business is a sustainable and profitable business. Happy customers reward you by willingly paying a premium price for your premium service while bragging about your team with five-star online reviews. They offer testimonials and referrals to their friends, family, neighbors, and co-workers.

IT ALL STARTS WITH EDUCATION

This type of high-performance success doesn't happen by accident. It requires a commitment to enhancing your mindset, investing in your toolset, and developing your skillset. 

Meet David Holt at NCI Summit 2022

Join us in Scottsdale, AZ this March during National Comfort Institute's (NCI) Annual **High-Performance HVAC Summit** to see David Holt address the importance of customer education in the success rate of high-performance HVAC sales closures. Holt is NCI's Director of National Accounts and an instructor.

Don't wait another minute!

Go to ncilink.com/WeKoPa22 to reserve your rooms today.

Learn more about Summit 2022 at gotosummit.com. Or call 800-633-7058.



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NCI's ALL-NEW
conference design
let's you **personalize**
your experience based
on your knowledge and
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with each topic!

**High-
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MARCH 27 - 31, 2022
SCOTTSDALE, AZ.



Personalize your Summit experience!

NCI's High-Performance HVAC Summit has become the gathering place for Performance-Based Contractors from across North America. It's the only event of its kind completely focused on selling and delivering High-Performance HVAC systems.

This conference is open to the entire industry. Summit is a gathering that welcomes like-minded people who are open and willing to share with their fellow high-performance HVAC professionals.

This year we decided to do things a little differently. We created a breakout session approach where each topic area will have three options:



Novice – Choose this level if you're just beginning to learn the specific discipline.



Practitioner – This stage is for attendees who have begun practicing these skills, and want to take it up a notch – or just need a refresher



Mastery – Choose this option if you're already proficient in a specific area, and are ready for the next level

This new conference design lets you choose sessions based on where you are today. You may need a Novice session in some areas, while in others you may be ready for Practitioner or even Mastery level training – you choose!

BE SURE TO BRING YOUR KEY PEOPLE

With the three different levels of sessions available, there will be 18 different break-out workshops to choose from! With so many breakouts we recommend you bring at least three people this year. Be sure to check out our special Three-Pack offer!

Visit the Summit Week website at GoToSummit.com to reserve your seats for what is shaping up to be the best Summit ever. Seats are limited this year and going fast, so don't delay, register for Summit 2022 today—and take your High-Performance HVAC business to the next level!

SPECIAL EVENTS

Welcome Reception & Celebration: Meet up with old friends and make new ones at this Welcome Extravaganza. Join your fellow Contractors from across North America to celebrate our industry's resilience during the tough times of the past year.

NCI Partners Reception and Trade Show: Our Partners help make this conference possible. Show your appreciation by attending the trade show events. You might find that next great product or idea!



Idea Meeting: All contractor attendees are invited to this two-part event where each participant can propose one or more ideas in the areas of lead generation and sales. Don't forget to bring your ideas and \$20 entrance fee. The best ideas split the pot for great cash prizes!

NCI Partners Educational Sessions: Pick from several special sessions hosted by NCI Member Rewards Partners. Topics will range from new HVAC technologies, to software, to business improvement seminars.

Awards Banquet: This long-standing tradition is one of the highlights of every Summit. Join us in honoring the best of the best High-Performance HVAC contractors. You may be one of them!

Tee off at the beautiful Saguaro golf course: This year, we're proud to introduce our Summit Golf Outing! We'll have plenty of fun and surprises as we gather for a friendly game of golf. Lunch is included and club rental is available. For more information and to register, visit GoToSummit.com/golf/.



Breakout Sessions

Session one: Airflow Diagnostics and Air Upgrade Workshops



NOVICE: USE AIRMAXX LITE™ TO EDUCATE YOUR CUSTOMER

How A Simple App Can Help Customers Understand Static Pressure And Airflow
Workshop Leader: David Holt

Properly measuring and understanding Total External Static Pressure (TESP), provides clues as to why your customer's heating and cooling system is not operating as well as it should. Poor airflow resulting from excessive static pressure at the fan can result in uncomfortable rooms and inefficient operation. Identifying and solving static pressure issues leads to happier customers and profitable sales.



PRACTITIONER:

AIRFLOW HOODS: THE GO-TO TEST INSTRUMENT FOR AIR UPGRADES

Get The Most From Your Airflow Hood Investment!

Workshop Leader: Rob Falke

One of the key factors in designing an Air Upgrade is knowing delivered airflows at the registers and grilles. A flow hood or air capture hood is an essential tool for quickly identifying poor airflow. In this workshop NCI's own "Doc" Falke will show you the different types of hoods, and what works best for residential diagnostics.



MASTERY: IDENTIFY DUCT INSULATION DEFECTS IN THREE EASY STEPS

Sharpen Your Duct System Diagnostic Skills

Workshop Leader: David Richardson

When ducts aren't properly sized, sealed, and insulated they can cause long run-times, discomfort, and wasted energy use. Learn how to quickly identify duct insulation defects in three simple steps. You will also learn how system temperatures are so important to overall comfort and system performance.

[Click here for more info on Session One](#)

Session Two: High-Performance Sales Workshops



NOVICE: GENERATE LEADS FOR PROFITABLE AIR UPGRADES

Help Your Customers Understand What An Air Upgrade Can Do For Them

Workshop Leader: John Puryear

It's not enough to measure static pressure on your service and sales calls. To convince your customer to take action, you need to be able to communicate your findings and what the readings mean in terms the customer can understand.

PRACTITIONER: SO YOU HAVE A DIAGNOSTICS-GENERATED LEAD. NOW WHAT?

How To Build An Air Upgrade & Renovation Sales Machine

Workshop Leader: Rob Falke

Each of your company's customers is already an Air Upgrade lead. In fact, they already want it, but don't yet know what it is, what it can do for them, or where to get it. When you perform static pressure testing on every service call, your company already has what it takes to generate these valuable leads.



MASTERY: HOW TO PRICE PROFITABLE AIR UPGRADES & RENOVATIONS

Price Air Upgrades And Duct System Renovations Based On Their Worth

Workshop Leader: David Holt

When pricing high-performance system upgrades and renovations, you must focus more on the lifetime value delivered and less on the estimated job cost. When you only consider raw costs, you minimize the craftsmanship involved in creating the high-performance results associated with your customer-built solutions.



[Click here for more info on Session Two](#)

Breakout Sessions

Session Three: High-Performance Implementation



NOVICE: BUILD CRAFTSMEN, NOT LABORERS

How To Overcome Flawed Perceptions With Your Installers

Workshop Leader: Jeff Sturgeon

Craftsmanship is no easy task. It's not something you're born with, rather it develops over time with mentorship. The truth is, to make a great system design work it takes a craftsman to install it correctly. Unfortunately, most installers don't understand the important role that they play in delivering high-performance systems.



PRACTITIONER: HOW TO CREATE CUSTOM AIR UPGRADES

Make Air Upgrades The Center of Your High-Performance Strategy

Workshop Leader: David Richardson

Air Upgrades are the perfect starting point for improving equipment performance as well as improved comfort and energy efficiency. In this session you will learn how to assemble customized Air Upgrade kits based on the installation conditions you see most.



MASTERY: ARE YOU LOSING MONEY DUE TO POOR INVENTORY MANAGEMENT?

Minimize Job Cost With Better Inventory Management

Workshop Leader: David Holt

Your sales team can make a profitable sale on paper, only to have the profits evaporate due to ineffective inventory management processes. From truck stock to installation and Air Upgrade kits, this workshop will help you learn ways to be more profitable through a well-designed and executed inventory management plan.

[Click here for more info on Session Three](#)

Session Four: Take it to the Next Level With High-Performance Software



NOVICE: USE COMFORTMAXX AIR™ ON EVERY SYSTEM YOU TEST!

How To Make ComfortMaxx Air The Most Valuable Tool In Your Arsenal

Workshop Leader: John Puryear

Discover how NCI's ComfortMaxx Air™ software can help you win over more customers and sell more Air Upgrades by demonstrating third party validation of your findings.



PRACTITIONER: COMFORTMAXX PULSE™ SYSTEM PERFORMANCE TESTING

Help Turn Your Techs Into Diagnostic Machines

Workshop Leader: Jeff Sturgeon

In this session, you will learn how NCI's ComfortMaxx Pulse™ software can aid you in your diagnostics and customer participation. This tool will help make your technicians diagnostic "machines." The workshop will cover each of the steps needed to collect the right pressures and temperatures, and generate a Pulse report you can review with your customer.



MASTERY: TOTAL HVAC SYSTEM RATING WITH COMFORTMAXX VERIFY™

The Ultimate System Performance Verification Tool

Workshop Leader: David Richardson

Learn how to prove the performance of your field-installed systems with NCI's ComfortMaxx Verify™ software. In this ground-breaking session, you'll discover how system verification can provide your customers with the ultimate peace-of-mind — and how it sets you apart from your competition.

[Click here for more info on Session Four](#)

Breakout Sessions

Session Five: High-Performance Town Workshops



NOVICE: DEVELOP GOOD STATIC PRESSURE HABITS

Hands-on Workshop Leader: John Puryear

Static pressure testing quickly opens the door to airflow diagnostics.

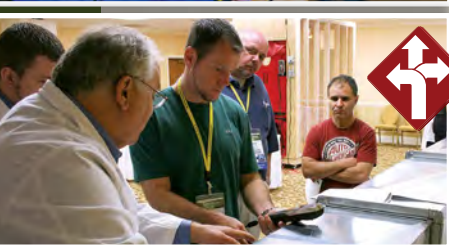
This simple test can uncover unseen opportunities for technicians and salespeople, and help installers provide higher quality installations.



PRACTITIONER: MASTER TRUE AIRFLOW DIAGNOSTICS

Hands-on Workshop Leader: Jeff Sturgeon

When it comes to HVAC system diagnostics, our industry has been using rules of thumb for far too long. These practices continue to cause misleading diagnosis and improper repairs—not to mention occupant discomfort, unhealthy homes, safety issues, and needless energy waste.



MASTERY: AVOID THE TOP 10 Btu MEASUREMENT MISTAKES

Hands-on Workshop Leader: Rob Falke

Btu measurement is a critical and exacting practice. Errors of just a few tenths of a degree can result in a major misdiagnosis and improper repairs. Discover Btu measurement mistakes that can easily be avoided in the field so you can accurately provide correct equipment and system diagnostics.

[Click here for more info on Session Five](#)

Session Six: Carbon Monoxide and Combustion



NOVICE: TWO MUST-DO COMBUSTION SAFETY TESTS

Keep Your Customers Safe!

Workshop Leader: Tom Johnson

Ambient CO and building pressure testing are critical to help assure both technician and customer safety. In this workshop you'll learn how to measure ambient CO, what test equipment you need, the action levels your team needs to know, and how to discuss your findings with your customers.



PRACTITIONER: VISION BEYOND SIGHT WITH COMBUSTION TESTING

Give Your Customers The Value They Deserve

Workshop Leader: Jeff Sturgeon

The right knowledge and test instruments can help give you X-ray vision when it comes to combustion testing. There are a lot of myths out there that can lead you astray. We will expose the most common ones and debunk many of these misconceptions.



MASTERY: ADVANCED VENTING AND COMBUSTION AIR SOLUTIONS

Solve Even The Toughest Combustion Issues

Workshop Leader: David Richardson

In this session, David will focus on why proper combustion testing is crucial to identify the right repairs and how to determine the most effective solutions. You will discover why venting and combustion air repairs are important and ways to help your team understand and explain them.

[Click here for more info on Session Six](#)

Session Speakers



Rob Falke

NCI President

Session One — Practitioner: Airflow Hoods: The Go-To Test Instrument for Air Upgrades

Session Two — Practitioner: So You Have a Diagnostics-Generated Lead. Now What?

Session Five — Mastery: Avoid the Top 10 Btu Measurement Mistakes



Dominick Guarino

Publisher of High-Performance HVAC Today and CEO of National Comfort Institute, Inc.

General Sessions

Award Banquet and Presentations Ceremony



David Holt

NCI Director of National Accounts

Session One — Novice: Use AirMaxx Lite™ to Educate Your Customer

Session Two — Mastery: How to Price Profitable Air Upgrades & Renovations

Session Three — Mastery: Are you Losing Money Due to Poor Inventory Management?



Tom Johnson

NCI Instructor

Session Six — Novice: Two Must-Do Combustion Safety Tests



John Puryear

NCI Customer Care Representative and Instructor

Session Two — Novice: Generate Leads For Profitable Air Upgrades

Session Four — Novice: Use ComfortMaxx Air™ on Every System You Test!

Session Five — Novice: Develop Good Static Pressure Habits



David Richardson

NCI Curriculum Developer and Instructor

Session One — Mastery: Identify Duct Insulation Defects in Three Easy Steps

Session Three — Practitioner: How to Create Custom Air Upgrades

Session Four — Mastery: Total HVAC System Rating with ComfortMaxx Verify™

Session Six — Mastery: Advanced Venting and Combustion Air Solutions



Jeff Sturgeon

NCI Field Coach and Instructor

Session Three — Novice: Build Craftsmen, not Laborers

Session Four — Practitioner: ComfortMaxx Pulse™ System Performance Testing

Session Five — Practitioner: Master True Airflow Diagnostics

Session Six — Practitioner: Vision Beyond Sight with Combustion Testing



Mike Weil

Editor-in-chief of High-Performance HVAC Today and Director of Communications at National Comfort Institute, Inc.

General Sessions MC: Idea Session Winners

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Schedule of Events

MONDAY, March 28

Pre-Summit Events

8:00 am - 4:00 pm	Goodman Business Planning Bootcamp
8:00 am - 5:00 pm	Advanced Airflow Diagnostics with Hands-on -Recertification Class
8:00 am - 5:00 pm	Advanced CO & Combustion Diagnostics - Recertification Class
5:15 pm - 5:45 pm	Summit Orientation Meeting - All Welcome!
6:00 pm - 8:00 pm	Welcome Reception <i>Sponsored by</i> 

TUESDAY, March 29

7:00 am - 9:00 am	Breakfast and Interactive Opening Session
9:15 am - 10:45 am	Breakout Sessions 1 – Workshops
11:00 am - 12:30 pm	Breakout Sessions 2 – Workshops
12:30 pm - 1:30 pm	Luncheon and General Session
1:30 pm - 3:00 pm	Breakout Sessions 3 – Workshops
3:30 pm - 5:00 pm	Idea Exchange Meeting – Optional
6:00 pm - 8:00 pm	NCI Partner Trade Show Reception

WEDNESDAY, March 30

8:00 am - 9:15 am	Breakfast & State of High-Performance HVAC with NCI CEO, Dominick Guarino
9:30 am - 11:00 am	Breakout Sessions 4 – Workshops
11:15 am to 1:15 pm	NCI Partners Trade Show and Luncheon
1:30 pm - 3:00 pm	Breakout Sessions 5 – Workshops
3:30 pm - 4:15 pm	NCI Partners Educational Sessions
4:30 pm - 5:15 pm	General Session: Idea Session Winners and Partner Prize Drawing
6:00 pm - 7:00 pm	Sponsor Appreciation Cocktail Reception
7:00 pm - 9:00 pm	Awards Banquet and Presentation Ceremony

THURSDAY, March 31

8:00 am - 9:30 am	Breakfast & General Session
9:45 am - 10:30 am	NCI Partners Educational Sessions
10:45 am - 12:15 pm	Breakout Sessions 6 – Workshops
12:15 pm - 1:30 pm	Closing Luncheon with NCI President, Rob Falke



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How You Can Avoid the Top 10 Btu Measurement Mistakes

Decades ago, when NCI first began to teach system and equipment Btu measurement, our test procedures pulled you into a deep and detailed science experiment that used test instruments considered antique by today's standards. Current Btu test procedures and instruments reduce your test time by more than half and double the accuracy.

With this in mind, there is little reason for NOT doing Btu measurements and even less reason for not doing them correctly.

BTU MEASUREMENT MALPRACTICE

Although you aren't a medical or legal practitioner, the term malpractice fits well with poorly executed Btu measurement. Malpractice is defined as "a dereliction of professional duty or a failure to exercise an ordinary degree of professional skill or learning."

Typical mistakes include three common calculation errors, five typical temperature testing

faults, and two airflow testing inaccuracies.

Btu measurement is a critical and exacting practice. Minor errors can result in major misdiagnosis and improper repairs.

As you discover Btu measurement mistakes, you will find they are easily avoidable, and you

can accurately provide correct equipment and system diagnostics and troubleshooting once you understand them.

BTU MEASUREMENT IN HALF THE TIME AND DOUBLE THE ACCURACY

Our Btu measurement procedures and test instruments were archaic in the early days. It took two to three hours to measure a system's Btu, and we were lucky to measure and calculate within $\pm 15\%$ accuracy. Today, many experienced and certified professionals can measure system Btu in about an hour with an accuracy of $\pm 7.5\%$.

National Comfort Institute's (NCI) original Btu test procedures were once bogged down by what we didn't yet understand. Since an operating heating or cooling system constantly changes air temperature, detailed procedures had you chasing readings all over the building, then running to verify the rate of change and estimating what the Btu deliver might be.

Our lack of knowledge about temperature probe location also evolved rapidly as we overcame barriers through testing and technical support with many of you in the field. Gaining testing experience also increased both speed and accuracy.

Temperature measurement instruments have been upgraded many times since the days when we carried a pocket full of analog thermometers. Back then, we had to manually calibrate the batch of thermometers and then run from thermometer to thermometer to write down the readings before the system temperatures changed.

Today, we use a tool bag full of Bluetooth temperature probes that report indoor and outdoor ambient, equipment, and system entering and exiting temperature values in precise measurement units. And best of all, our instruments



collect every needed reading and record it simultaneously.

Converting wet bulb readings to enthalpy using charts and conversion factors are also slipping into history.

THREE COMMON CALCULATION ERRORS

Typically, you juggle up to 100 air flow, temperature, and system data values during Btu field testing. It's not uncommon to lose your place or flip-flop numbers when making calculations, especially when filling out paper reports using the calculator on your phone.

Is it Delta T or Delta H? – Delta T (temperature difference) and Delta H (enthalpy difference) are often swapped when testing and making Btu calculations. Since many temperature probes show all types of temperature values at one time on your smartphone, a repeated error is recording the opposite temperature unit of measurement. Remember, in heating mode, use Δt , and in cooling mode, use Δh .

Btu multiplier substitution – Using the incorrect Btu multiplier is one of the most common mistakes made in the field. Using the wrong multiplier is easier than you think because measured Btus are often so low that the calculated Btu value is hard to reckon immediately. When calculating cooling Btus, the multiplier is 4.5. The heating mode multiplier is 1.08.

Adjusted equipment rated capacity – Equipment rated capacity at the time of testing is the divisor in the formula that makes Btu diagnostics easy.

To be accurate, you measure and record ambient dry bulb, and entering

wet bulb temperatures. Then you plot equipment rated capacity.

Once you measure and calculate delivered Btu, you divide it by equipment-rated Btu to find the percentage of Btu the system delivers.

To avoid all three calculation problems, consider using **ComfortMaxx™** (ncilink.com/CMaxx4-0) software.

When entering system test data into the software, each of the above measurement units, multipliers, and corrections are pre-selected for you.

A new ComfortMaxx™ feature includes an autofill equipment-rated Btu capacity.

FIVE TYPICAL TEMPERATURE TESTING MISTAKES

Using old school test instruments – That's a mistake. Accurate Btu testing requires you to use temperature probes that simultaneously gather and report all equipment and system temperatures. If you don't have enough probes to capture all the data at once, you can test the grille and

register air temperatures, then test the equipment immediately after.

Improper test probe locations – Temperature probes placed near the outlet of the equipment may pick up radiant heating or cooling and throw temperature readings off by up to 25%. So place probes out of sight of heat exchangers, cooling coils, or heat strips.

Not knowing when to capture test data – Timing is an essential consideration when gathering temperature field data. When a system is operating, air temperatures constantly change. For example, simultaneously collecting equipment and register information is ideal and impacts accuracy.

Adjust the thermostat or equipment so the equipment continues to operate during the test. Then assure the equipment is operating at full capacity and stabilized before testing.

Inaccurate supply and return grille temperature averages – To avoid this, find average grille air temperatures, take grille temperature measurements to the nearest tenth of

Meet Rob Falke at NCI Summit 2022

Rob "Doc" Falke, president of National Comfort Institute (NCI) will provide hands-on Performance Town training at NCI's Annual **High-Performance HVAC Summit** in Scottsdale, AZ from March 27th to 31st. So if you want to see this article come to life, join us there. You can learn more about Summit 2022 at our website: gotosummit.com.



There is still time to take advantage of early bird registration. It ends on February 15, 2022.

You can still save hundreds on your registration costs. And don't forget to book your hotel. Go to ncilink.com/WeKoPa22 to reserve your rooms today. **If you have questions**, be sure to call 800-633-7058 and ask for a Customer Care Representative.

a degree, add them together and divide by the number of readings taken. Hitting the wrong numbers on your phone is way too easy for most of us. Confirm your calculation twice.

No outdoor ambient or entering wet bulb readings – Outdoor dry bulb and equipment entering wet bulb readings in cooling mode are *both required* to determine current equipment rated capacity. Unfortunately, since we don't do any math with these two temperatures, we only plot their equipment-rated capacity; it's easy to skip collecting them in the field.

TWO POSSIBLE AIRFLOW INACCURACIES

Airflow at the equipment – It's often difficult to find a good airflow tra-

verse location near the equipment. Ideally, you will build your systems with reliable traverse locations. You can measure static pressure and plot fan airflow, but at times this may not be accurate enough to satisfy your equipment Btu calculation needs.


Airflow at the supply registers – Total airflow entering a building through supply registers is required to calculate system delivered Btu. A balancing hood is easy and accurate when you can get to all the registers. When you can't, traverse the grilles and be sure to make a custom field correction factor.

OVERCOME BTU OBSTACLES

Although you learned the basics of Btu measurement when you were certified, you'll discover that your accura-

cy regularly improves as you practice, gain experience, and grow your skills.

I remember the day when David Richardson had less than one month of Btu measurement experience under his belt and hit his first barrier. His opening words on the phone were, "I have learned system testing doesn't work for me." When I asked why, he responded, "I just measured 122% of equipment rated Btu on a system, and that's impossible!"

You will face many obstacles as you learn to measure system Btus accurately. The question is, will you be like David and overcome and learn from each obstacle? Or will you be easily derailed by a few barriers you will undoubtedly face as you take your career far beyond the rest of the industry? 

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Be sure to take advantage of this lead-generating tool today!



Call NCI Customer Care at 800.633.7058 to find out how to be listed and featured.

Commercial Construction:

2022 Infrastructure, Inflation, & Insights

The U.S. economy is up 4.9% from the prior year, according to the latest **U.S. Real Gross Domestic Product (GDP)** data. However, the rate of rise is down from the prior quarter, indicating that GDP has entered a period of slowing growth. Expect general slowing growth for the U.S. economy into the first half of 2023.

The “why” for slowing growth in 2022 is complex. Leading indicators point decidedly downward, signaling a business cycle decline this year. However, the economy is going into the backside of the business cycle with elevated corporate profits, low interest rates, record-high retail sales, and strong consumers who, having paid down debts during the last two years, are in an excellent financial position.

Don't ignore consumer strength. It will be an essential contributing factor to keeping the economy out of recession as we near the low of this business cycle in 2023. Compared to 2021, this year and ultimately 2023 will be different in that consumers will unlikely receive large influxes of cash from the government. Instead, they may tap into savings or take on debt to help fuel consumption.

U.S. Personal Savings as a Percentage of Disposable Personal Income dropped to 6.9% in November 2021, lower than the average of 7.7% for the two years preceding the pandemic. The newly passed infrastructure spending package is not likely to hit the economy in earnest in 2022.

However, **this is not cause for alarm** – just be prepared for the overall economic growth rate to slow in 2022 and 2023 as things normalize.

COMMERCIAL CONSTRUCTION

If you are involved in the commercial construction market, you are likely not yet feeling this

period of slowing growth. Instead, you are in the part of the business cycle that is characterized by accelerating growth. Enjoy!

U.S. Private Commercial Construction for the most recent 12 months totaled \$85.7 billion, coming in more than \$5 billion higher than where the market was at the start of 2020. We project commercial construction to exceed \$90 billion by the end of 2022, putting the market at a new record high that will surpass the previous record high set before the Great Recession.

When we talk about construction, two concerns frequently arise:

- Infrastructure bills and their impact on the construction market
- Inflation's impact on the construction market.

INFRASTRUCTURE BILLS IMPACT ON THE CONSTRUCTION MARKET

At ITR Economics, we are frequently asked if we plan to change our forecast for US GDP and, more specifically, our construction forecasts due to the **Infrastructure Investment and Jobs Act**. The general answer is no. While \$1.2 trillion is a lot of money, it is not going into the economy all at once. It will be spread out over five years and take time to make its way into the economy, unlike the quick shot to the arm provided by the 2020-21 stimulus spending. Additionally, it is important to remember that of that \$1.2 trillion, Congress was already planning to authorize \$650 billion as part of regular operations.

Select construction markets will receive a boost from this act. The spending package targets infrastructure segments such as transit, highways, rail, power infrastructure, water, and high-speed internet. While the package will not provide funding to all aspects of construction, it will

offer some longer-term benefits to the economy.

Enhancing the above segments of our infrastructure will allow other parts of the U.S. economy to grow by reducing the cost of doing business via more efficient infrastructure.

Since nothing occurs in a vacuum, we must also be aware that the draw on resources required to complete these projects will increase the inflation risks already building in the economy.

INFLATION'S IMPACT ON THE CONSTRUCTION MARKET

Current headlines are running rampant with talk of inflation, frequently quoting the Consumer Price Index (CPI) or Producer Price Index (PPI). The rapidly rising inflation is something we cannot ignore, particularly after experiencing relatively low inflation during the prior two decades.

Because of what we have grown accustomed to, today's inflation seems so foreign and concerning for many. The good news is that inflation will ease in 2022. However, it's vital to be clear: while the rate of rise in prices will ease, we're not expecting deflation. Prices will be going up in 2022, but the rate of rise will lessen as we progress through the second half of the year.

When thinking about inflation, carefully select the measure of inflation most applicable to you.

The **U.S. Producer Price Index** measured inflation at 12.6% for the three months through November. This number is frequently reported on, making it an easy benchmark for you to use for pricing. However, let's look at a measure of inflation that is more specific to the construction industry. We see that prices for construction

materials in the three months through November were up 31.3% from the same period one year prior.

Construction material prices have risen faster than overall producer prices for multiple reasons, but they all boil down to economic fundamentals – supply and demand. Simply put, during the past year, demand for materials increased faster than our supply chain could supply those materials.

MORE SUPPLY CHAIN ISSUES

Before COVID-19, tariffs were starting to squeeze the domestic supply of some materials such as steel. The 2020 wildfires combined with regulatory changes for lumber mills began to constrict the supply of lumber.

More recently, the supply chain constraints made highly visible by backlogged cargo ships off the coast of California reduced the availability of other materials. All of this was happening while demand was increasing.

While demand from certain segments of commercial construction, such as office buildings, declined during the past two years, demand for warehouses has increased amid the effort to accommodate the e-commerce segment of our economy.

However, the biggest draw on

construction materials came from the market's residential side. Between **U.S. Single-Unit Housing Starts** reaching a nearly 14-year high and home remodeling projects skyrocketing due to a quarantined consumer, materials were subject to a demand squeeze.

The housing market is beginning to cool, and it is already suggesting that prices for construction materials will ease in 2022. This may mean that the top line for construction projects will look less robust.

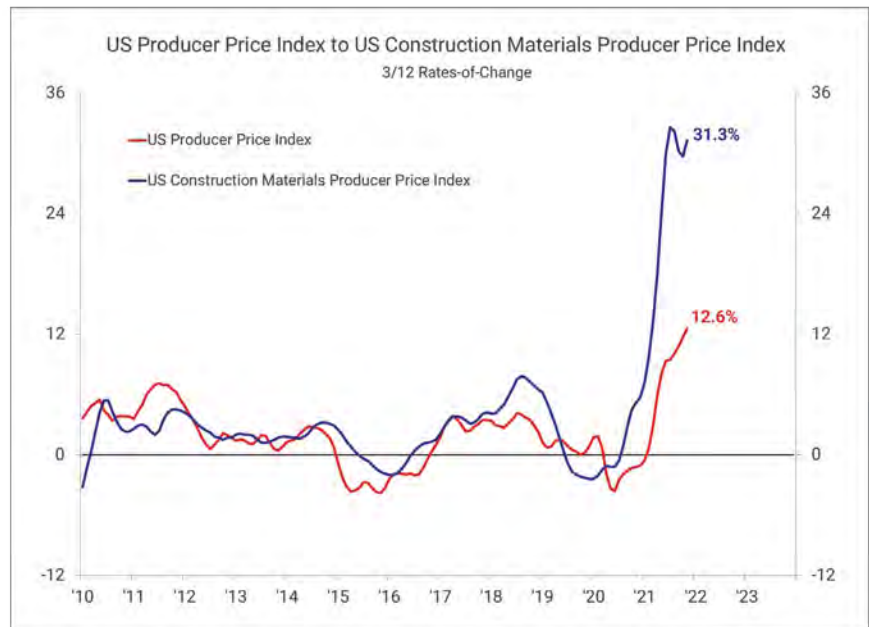
However, the shift will likely spur on some projects that were on hold, waiting for prices to settle back down, or materials to be more readily available.

When planning for the upcoming year, be prepared for growth across many nonresidential construction segments and ensure you are using the appropriate inflation metrics to determine real growth versus inflation. **NCI**



Jackie Greene is Vice President of Economics and has served ITR Economics' ([itreconomics.com](https://www.itreconomics.com)) clients since 2005. She has contributed to the company's forecasts, publications, and thought leadership.

Jackie works with many clients in a one-on-one capacity and delivered keynote addresses on multiple continents.



Welcome to Our New NCI Trainers

National Comfort Institute (NCI) is pleased to announce the addition of three new trainers to our High-Performance HVAC family. Please join us in welcoming all three. They bring professional experience and industry knowledge to the game and will enhance the training offers we have for you, our members:

Jim Ball recently sold his HVAC company, Ball Heating and Air and wants to give back to the industry. He hopes to help those involved with NCI to move forward with the implementation of high-performance processes into their businesses. Jim has been recognized as an NCI Contractor of the Year, he received the Chairman's Award, and The John Garofalo Implementation Excellence Award at Summit in the past. Welcome aboard, Jim!



Jayme Carden began working in the construction industry in the 1980s in all areas from residential remodels to large-scale development projects. He became involved with HVAC testing and diagnostics in the early 1990s, eventually partnering with NCI's Scott Johnson to form Maximum Performance Housing, Inc., an HERS rating outfit in California.

In addition he worked with IHACI (Institute of Heating and Air Conditioning Industries) as a trainer and curriculum developer. Jayme joins NCI as a trainer and will be working with the California team as an in-class High-Performance HVAC trainer.

Mitchell Bailey is the owner of Bailey's



Heating and Air Conditioning in Modesto, CA. He is a member of ACCA, RSES, and IHACI, and currently holds six different NATE certifications as well as certifications in duct design, load calculations, Title 24, Wrightsoft, zoning, and home automation. He joins the NCI training team in California with more than 38 years of on-the-job experience and has serviced and installed thousands of HVAC systems.

Once again congratulations to these three additional members of the NCI training team!

Why the NSI 6000 is NOT Sold Direct

National Comfort Institute (NCI) staff are often asked why we don't sell the National Safety Instruments (NSI) 6000 Carbon Monoxide (CO) monitor directly to the public? The truth is that we could sell more monitors if we marketed and sold them directly to consumers.



There are, however, some significant reasons why — for nearly 20 years — we choose to only sell through trained professionals. To understand why, it's essential to know the difference between a low-level CO monitor and a CO detector that you can purchase at any retail outlet.

In his recent blog post, NCI's Director of Sales and Operations Nick Guarino explains those differences and provides the reasoning why trained professionals are the only way to make sure that consumers are not only safe in their homes, but that they are educated about what

to do in the case the NSI 6000 alarms.

You can read his entire post here: ncilink.com/Nick6000.

He warns that most fire departments and public utilities are NOT trained in what to do and often ignore calls from customers whose monitors are alarming as nuisance calls.

If you are interested in learning more about this low-level CO monitor, check out Nick's video here: ncilink.com/NSI6000Vid1.

February PowerPack


In this February 2022 edition we focus on some documents and brochures your team can use to capture data and



communicate with customers about what is happening with their HVAC system that impacts their comfort.

We think you'll find these tools and training materials very helpful as you continue to grow your High-Performance HVAC business. Be sure to share them with your team during the month of February:

- **Static Pressure Test Diagram (Download)**
- **Cooling Test-in Report (Download)**
- **Fundamentals of Fan Airflow (Online Training)**
- **Value and Comfort Pre-Season Performance Air Conditioning Tune-up Flyer (Download).**

Just go to ncilink.com/PwrPak to access it today. If you have any questions or are unable to access any of the tools in this program, please contact us at 800-633-7058. 

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**Editor-in-Chief and
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Why Every Salesperson Should Learn How to Test



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

We commonly hear from contractors that salespeople are not techs and they don't want to learn how to test an HVAC system before they propose a replacement.

If a salesperson truly cares about doing the right thing for his or her customer, it's exactly what they should know how to do.

Testing can help provide your customer with the safest, healthiest, most comfortable, and energy-efficient system possible. This process is easily learnable even by the least technical individual.

Let's look at the three measurements a salesperson should learn how to take on every working system they encounter.

STATIC PRESSURE

Static pressure truly is the blood pressure of the system. An equipment's Total External Static Pressure (TESP) is equivalent to the highest blood pressure the heart sees. It's an indicator of what's going on with the entire system, and it allows you to interpret airflow leaving the fan.

Typically the higher the static, the lower the airflow. While this doesn't tell the whole story of whether a home is comfortable, or how much energy is being wasted, it's a very good start.

TEMPERATURE

By adding temperature to the equation you can begin to see a clearer picture of what is going on. You can start by measuring temperature at the supply and return side of the equipment to get a ΔT , or temperature change.

In heating mode, you subtract the sensible return temperature from the supply temperature to determine the temperature increase from the equipment. In cooling mode, you measure sensi-

ble and latent temperatures to get enthalpy, and subtract supply enthalpy from return enthalpy to determine the temperature reduction (ΔH).

You can also measure supply register and return grille temperatures in the same way to get a rough idea of the entire system's delta. Then multiply this number by the airflow interpreted with your TESP reading to get delivered Btus. There's a little more to it, and while this is just a rough snapshot, it will give you a pretty good idea of the existing system's performance.


AIRFLOW

While you could measure airflow at every supply and return, this often isn't necessary during a sales call. Instead, use an airflow hood during the initial interview process with your customer.

As you discuss existing issues and determine which rooms don't heat or cool as well as they should, you can take the customer to those rooms and directly measure airflow at the registers and grilles. This is a key part of the educational selling process. Nothing compares to the customer actually seeing what is going on with their own eyes.

Each of these tests require some training and good instruments to quickly perform them. The tests will take a bit longer at first, and we recommend practicing by performing them on your own home or a relative's home the first few times.

Most find that in no time they can do this testing very quickly and efficiently, truly impressing their customers. NCI even has a free app you can use on a smart phone to speed up the process.

The key is getting started. Even your least technical salesperson will be testing like a pro in no time, setting you apart from the competition. And they will be doing the right thing to provide your customers with the value and quality comfort system they deserve. 

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UPCOMING 2022 NCI TRAINING SCHEDULE

PUBLIC LIVE TRAINING

Commercial Air Balancing Certification Program

Feb 8-10: Tampa, FL (**SOLD OUT**)
March 15-17: Centennial, CO

Combustion Performance and Carbon Monoxide Safety Certification Program

Feb 8-10: Monroeville, PA
Feb 22-24: St. Louis, MO
Feb 22-24: Richmond, VA

Duct System Optimization and Residential Air Balancing Certification Program

Feb 8-10: Centennial, CO
Feb 14-16: Orlando, FL
Feb 15-17: Lansing, MI
March 1-3: Glen Burnie, MD

Residential HVAC System Performance and Air Balancing Certification Bundle

Feb 22-24: Sheffield Lake, OH

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Combustion Performance and Carbon Monoxide Safety Certification Program

Feb 15-17: Los Alamitos, CA

Airflow Testing & Diagnostics

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***SCE SPONSORED LIVE TRAINING (Cont.)**

Commercial System Performance

March 17-18: Los Alamitos, CA

Duct System Optimization and Residential Air Balancing Certification Program

March 29-31: Los Alamitos, CA

****TECH CLEAN CALIFORNIA TRAINING**

<http://ncilink.com/TECHCleanCA>

Refrigerant-Side Performance Certification Program

Feb 8-9: Sacramento, CA
Feb 24-25: Los Alamitos, CA

Residential HVAC System Performance and Electrification

Mar 1-3: Los Alamitos, CA
Mar 15-17: Sacramento, CA

*NCI training sponsored/subsidized by Southern California Edison (SCE) for qualified local contractors

**NCI training sponsored by TECH Clean California for qualified local contractors



Visit NCIlink.com/ClassSchedule to view the latest schedule of NCI Training events