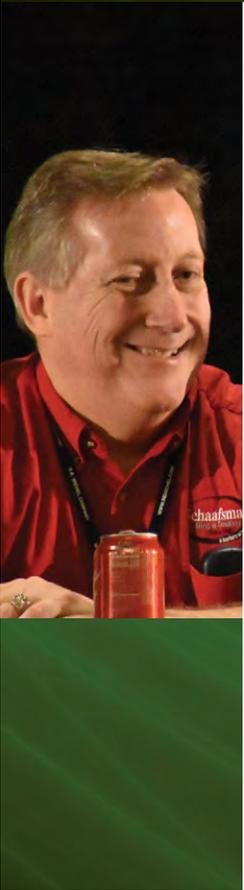


# HIGH PERFORMANCE HVAC TODAY™

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

**SUMMIT 2018 PANEL DISCUSSION:**

## Achieve Success with High Performance Implementation



**ALSO IN THIS ISSUE:**

What is High Performance Contracting and Why Should You Do it?

How Surface Temperatures Reveal Elusive Comfort Problems

Contractor Spotlight: James A. Wheat and Sons

# HIGH PERFORMANCE HVAC TODAY™

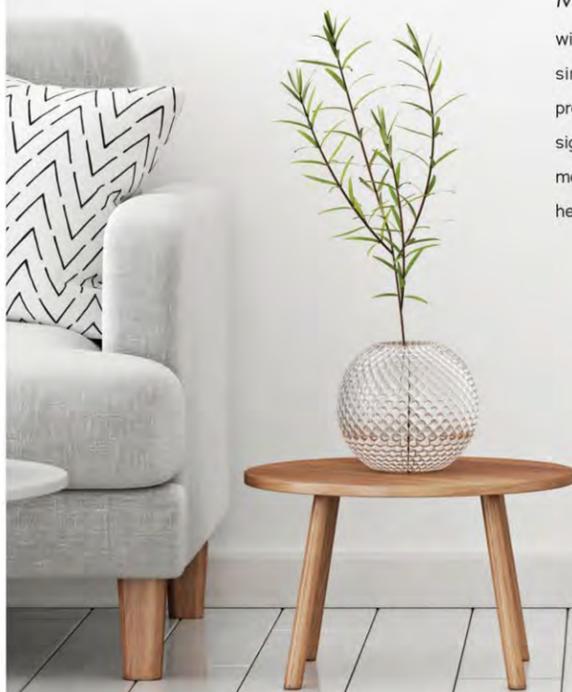
## OFF THE WALL? (Genius!)

### ComfortBridge™ communicating technology

**More Options.** Taking the communicating circuit board off-the-wall and putting it securely inside the HVAC system means that the **ComfortBridge** system is designed to work seamlessly with numerous single-stage thermostats. Imagine using the same single-stage thermostat for all your HVAC installations. When properly installed, **ComfortBridge** technology receives a simple signal from the thermostat and intelligently distributes operational messages between the indoor and outdoor components of a central heating and cooling system.

**More Benefits.**

**More Control.**



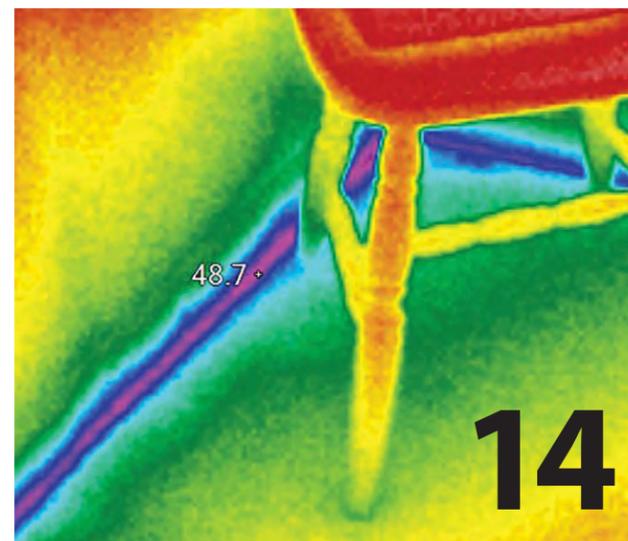
ComfortBridge technology is engineered exclusively for high-efficiency Goodman and Amana brand heating and cooling systems.



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### COVER STORY: Summit 2018 Panel on Implementation

Six HVAC contractors share their struggles with implementing performance and how they overcame them.



14

**TECHNICAL:**  
**Surface Temperatures and Comfort**  
David Richardson examines several factors external to the HVAC system that influence comfort.



21

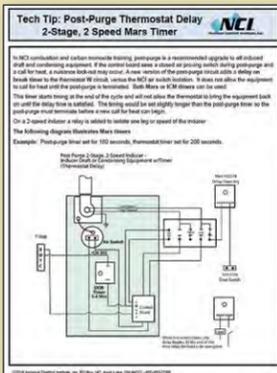
**MANAGEMENT:**  
**What is Performance and Why Do It?**  
In Part 1 of this multi-part series, Dominick Guarino addresses exactly what Performance-Based Contracting™ is and why you should incorporate it into your company.

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## FREE Monthly Download



Last month our download was about Post-Purge Thermostat Delays with ICM timers. This month we focus on Post-Purge Thermostat Delays using the Mars timer.

These delays are recommended by NCI as upgrades to all induced draft and condensing equipment. This is for both one and two-stage delays.

This download includes two data sheets that illustrate the circuits and applications.

Go to [ncilink.com/md0718](http://ncilink.com/md0718), or use your phone with the QR Code below.

By registering for free on NCI's website, you can access this download and many more.

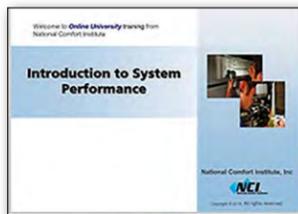


## Online University

Featured this month is the *Introduction to System Performance* module of the NCI Online University Advanced Technical Training. Based on the NCI mantra that if you're not measuring, you're just guessing, this module introduces you to the basic principles, terms, and concepts of system performance.

It is the starting point for several key goals that include knowing what measurements to take and how to take them, recognizing what test numbers to record, diagnosing based on the results, and more.

Learn more here: [ncilink.com/ou0718](http://ncilink.com/ou0718).



## BLOG POSTS

### STATIC PRESSURE TIPS IN SIX EASY STEPS



Rob Falke likes to explain static pressure in terms that equate it to blood pressure in humans. In this blog post he explains how statics help you see the HVAC system in a new light, helps you find problems you otherwise wouldn't know were there, and then explain it to consumers in terms they understand. He boils this down to six steps to make it easier for you to implement.

Read it here: [ncilink.com/StaticsMadeEasy](http://ncilink.com/StaticsMadeEasy)

### HVAC INDUSTRY AT A CROSSROADS: STEP UP OR BE STEPPED ON!



The HVAC Industry is at a crossroads and Dominick Guarino says we've had more than enough time to step up and deliver proven, measured performance. Is time running out on us? Dominick explains in this blog post.

Read it here: [ncilink.com/Crossroads](http://ncilink.com/Crossroads)

## There's an App For That ...

How many HVAC-based mobile apps are out there? How many of them are legitimate? That is anyone's guess. But NCI's David Richardson makes it his business to find those that make the most sense for Performance-Based Contractors™.



This month, his pick is the **HVAC Check & Charge™** mobile app from Emerson Climate Technologies. This app provides an on-site refrigerant charge calculator for air conditioning applications.

Based on historic sliding cardboard charge calculators, contractors can easily calculate correct system refrigerant charge for R-22 or R-410A. Simply choose Sub-cooling, Superheat, or Airflow, and enter the specified system temperatures along with the latent and sensible environmental loads. These values are used to determine the proper system charge.

This free Emerson app is available on both the [Apple](#) and [Google](#) app stores.

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## Introducing NCI's First High Performance Mobile App:



NCI's new AirMaxx Lite™ app features easy-to-use data entry and easy-to-display reports.

Get started on the path to High-Performance HVAC™ today!

Download this free app (available for both Android and iOS phones) onto your phone or tablet, and immediately start using it to display an airflow 'grade' for your customers.



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## Where Have All the HVAC Technicians Gone? *An Update*



Mike Weil is editor-in-chief and director of communications and publications at National Comfort Institute, Inc.

**A**s I write this column, the temperatures here in Cleveland are beginning to soar and the busiest season of the year for most contractors is upon us. It's also that time of year where contractors struggle to have enough good technicians on staff to handle the increased load and keep customers satisfied.

Early in my career, I wrote my first feature story in another HVAC trade magazine. It was in 1984 and focused on a burgeoning commercial retrofit market that needed a pool of talented technicians to handle the growing workload. That pool was nearly empty.

In the 34 years since printing that article, not much has changed.

Recently, the U.S. Bureau of Labor Statistics (BLS), estimated the current HVAC technician shortage at around 70,000. They also predicted a need for 115,000 new HVACR professionals to meet demand within the next four years!

**WHERE HAVE ALL THE YOUNG PEOPLE GONE? THEY ARE OUT THERE. YOUR PERFORMANCE-BASED CULTURE CAN HELP REEL THEM IN.**

Also, according to a joint industry survey conducted by Sage and the Associated General Contractors of America (AGC), though many companies see a growing demand, their optimism is tainted by increasing concerns about workforce shortages.

So what is going on?

Let's start with the age of our field workforce. Today, according to BLS, 72% of them are between the ages of 22 and 55, with the bulk of those in the Baby Boomer set — closing in on the 50-year mark. That means more technicians will be retiring at a faster rate as time goes on.

So where are the young people? Consider this: because of a lack of Federal and State support for HVAC (or any trade) education, high schoolers continue to be steered toward college degrees by counselors. There is very little promotion of the trades for these youngsters. Our own industry does a poor job of self-promotion.

Furthermore, when you do a Google search for HVAC careers, the results are a lot unsatisfactory summaries that paint our industry negatively. They say HVAC offers low-paying construction jobs requiring long hours, cramped conditions, and adherence to confusing codes and regulations.

It doesn't help that the news media loves a good contractor sting story to further blacken our collective eye. Very little coverage is given to the positives this industry provides society.

But there should be. The HVAC Industry is vital to this nation. Our technology and services enable Americans to live and work in temperature-hostile environments like the Southwest. Our industry keeps food supplies and medicines fresh so they last longer. We help save lives by eliminating combustion issues that lead to carbon monoxide poisoning.

Oh yeah — the HVAC Industry contributes heavily to overall productivity.

So how can you find needed young people to work for your company? Read our Panel Discussion on page 16 and see how Performance-Based Contractors are doing it.

Don't understand how performance can be your ticket to more young people? Read Dominick Guarino's article on page 21 that defines what performance is and why it benefits your company and your customers.

Where have all the young people gone? They're out there. Your Performance-Based culture will help reel them in. Have a great, profitable summer.

# Celebrations and Announcements

## Danfoss 50th Anniversary

Danfoss is celebrating a milestone anniversary in 2018 --- the 50th anniversary of being the first company to mass-produce AC drives. The company remains a forerunner in drives technology and digital solutions.

Danfoss has always been 100% focused on developing, manufacturing, and supplying AC drives. Since 1968, its portfolio of high-quality, application-optimized products and services has been designed to maximize process performance, save energy, and minimize emissions.

Company spokespeople say they always give customers the freedom to optimize and equip Danfoss drives to ensure they engineer the best possible AC-drive solutions without compromises, and find the optimum outcome for the challenges they face.

In a recent press release, the company announced its re-affirmation and commitment to its customers and partners. To address the megatrends affecting the world today, Danfoss says they are innovating technology to tackle climate change, cope with rapid urbaniza-

tion, provide successful and sustained water and wastewater management, and bridge the lag between energy generation and consumption.

In addition, the latest trends in automation and connectivity are allowing Danfoss to change the way it works to further drive customer success and provide an ultimate, end-to-end, digital experience.

**Focusing on the future.** Capitalizing on decades of experience, Danfoss Drives is passionate about the future. According to a company spokesper-

son, it is estimated that by 2025 more than 5 billion people (over 50% of the estimated world population) will benefit directly or indirectly from Danfoss Drives in their everyday lives.

"The installed base of AC drives will help to save the annual equivalent of 60 hours of global energy consumption," the spokesperson says.

Danfoss Drives has been around for 50 years, and their spokesperson says the hopes, the vision, and the passion of the company and all its employees are still as fresh as they were back in 1968.

## ServiceTitan on Inc.'s Best Workplaces List

ServiceTitan, creators of field service management software for residential electrical, plumbing, and HVAC services businesses in the U.S., was recently named one of the best workplaces for 2018 by [Inc. magazine](#) in its third annual survey of privately held companies.

More than 1,800 companies competed for a spot on [Inc.'s Best Workplaces 2018 list](#), which rates employee engagement and satisfaction, career development, benefits, leadership, and employee/management relationships. The full list of 285 winners is featured in the current issue of Inc.

"It's an honor to be on this list with so many other employee-driven companies," said ServiceTitan CEO Ara Mahdessian. "A strong and vibrant company culture has always been a priority for ServiceTitan.

"We rely on a dynamic, purposeful team to provide the level of service and support we promise our customers. And in today's competitive job market, that's more important than ever."

*Inc.* magazine was founded in 1979 and covers small business, startups, and entrepreneurship. For more information, visit [www.inc.com](http://www.inc.com).

[ServiceTitan](#) was founded by Mahdessian and Vahe Kuzoyan in 2011 when the former Stanford classmates discovered there were few software options to recommend to their fathers—both of whom were tradesmen. ServiceTitan now has more than 400 employees and more than 2,000 client businesses throughout the USA and Canada.

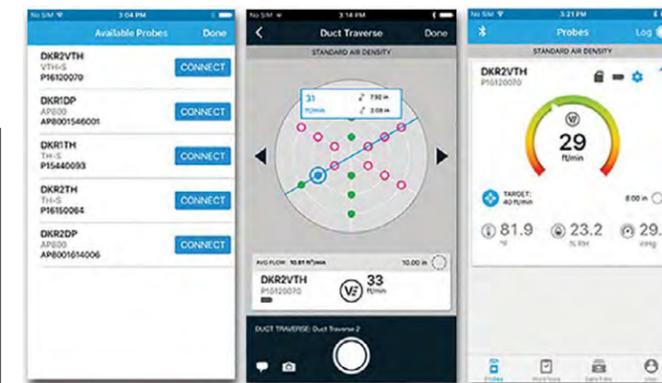


## AirPro® Air Measurement Kit

TSI Inc. has introduced a wireless velocity meter known as the AirPro® AP500. This rugged, compact, configurable and high performing device is used with the AirPro® Mobile Application Software, plug-and-play measurement probes, and user-defined feature sets.

For use in HVAC system commissioning and troubleshooting, it measures air velocity, temperature, and humidity. It has a subset of operational controls and reporting capabilities that use Bluetooth® to communicate wirelessly in real-time with TSI's mobile app. The app is both Android and iOS compatible.

The [National Comfort Institute](#), a TSI product reseller, has bundled the AP500 with your choice of a straight or articulating probe. The AirPro® Thermo-Anemometer Probe Model VTH-S measures



velocity and relative humidity while enabling the calculation of airflow, wet bulb, and dew point temperatures. The probe attaches directly to the AP500.

The Model VTH-A articulating probe does all the above plus, when used with optional stackable probe extensions, gives technicians the ability to take readings in hard-to-reach situations without needing to use a ladder.

The bundled kit comes with the TSI AP500 AirPro Velocity Meter, your choice of the straight or articulated probe, and TSI AirPro Small Carrying Case.

For more information, go to [ncilink.com/AP500](http://ncilink.com/AP500).

## August 2018 NCI Training Schedule

**Combustion Performance & Carbon Monoxide Safety Certification Program**  
 Aug 14-16: Bloomington, MN  
 Aug 21-23: Medford, MA  
 Aug 28-30: Los Alamitos, CA\*

**Residential HVAC System Performance & Air Balancing Certification Program**  
 Aug 21-23: St. Louis, MO  
 Aug 28-30: Pittsburgh, PA

**Commercial HVAC System Performance Certification Program**  
 Aug 14-15: Cleveland, OH  
 Aug 28-29: New Hudson, MI

**Commercial Air Balancing Certification Program**  
 Aug 21-23: White Plains, NY

\*Subsidized NCI training offered by Southern California Edison.

Visit [NCIlink.com/ClassSchedule](http://NCIlink.com/ClassSchedule) to view the latest schedule of NCI Training events



## PROPOSALS ON THE SPOT

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# James A. Wheat & Sons: Focused on Comfort

In 1977 the world was much different than it is today. It was the year of the infamous New York City Blackout which lasted 25 hours. It's also the year that Elvis died, Jimmy Carter was elected President of the United States, the Alaskan Pipeline was completed, and NASA launched its first test flight of the Space Shuttle. And in the city of Gaithersburg, MD people were lining up to see the very

books. The company was small but nimble and Jim focused on treating customers like family. He built a reputation for quality service.

In those early days, this plumbing business was all in the new construction sector with some work in residential service and remodeling. Then, in the mid-1980s, new construction began its decline, so Wheat dropped it and to focus on residential service and remodeling.

## HEATING AND AIR CONDITIONING WORK

Early into the 1980s, Wheat began dabbling in the heating and air conditioning business. That was due to a good friend who worked for the government and needed help with installations and permit pulling. So, gas-fired heating and air conditioning became a small part of what Wheat's company did.

According to Jeff Wheat, his father went to Syracuse, NY and took classes from Carrier Corp. Those initial classes lead to a culture of learning and training that persists today.

Today James A. Wheat & Sons is in the plumbing, heating, and air conditioning business. They do around \$1.75 million in plumbing and \$3.25 million

in HVAC – all in the residential service and remodel marketplace.

## MORE FAMILY IN THE FAMILY BUSINESS

His oldest son, Michael, grew up in the business, graduated high school, and opted to go to college. He earned a degree in business, and after graduation, joined his father's company managing the office.

Jeff Wheat also spent many of his early years helping out at the company. He jokingly says he started working when he was six-years-old. When he finished high school, he opted out of college and became part of his father's full-time team working in the field and earning certifications in the technical aspects of installing, repairing, and replacing plumbing and HVAC systems.

"In between all that, I also attended a trade school," he says. "But that was just one day a week. In 1992 I was in a truck and have been working full-time managing the technical side of the business ever since."

According to Jeff Wheat, he and his brother bought out their parents in 2008. That was the year that China hosted their very first Olympic games and Michael Phelps won a record-breaking eight gold medals. It was the year the world's economy nose-dived in what was dubbed the worst financial crises since the Great Depression.

It was a time of hunkering down and taking care of business. Jeff ran all the jobs, made sure the service and instal-



The eagle has been part of the Wheat identity since the company's beginning.

lation technicians did the work properly, and helped them do that by providing the right tools, instruments, and trucks.

Michael ran the business. Jeff says, "If it wasn't for my brother, we'd own every tool and toy in the world. And we would be broke. So, it is a pretty good balance."

That is not to say that Michael isn't technical. Jeff says they both worked in the field and Michael understands what needs to be done in that area as well. But his focus is on managing the business and Jeff handles all the technical aspects of the company.

## THE NCI CONNECTION

The onslaught of the 2008 recession didn't stop the brothers from a mission of growth and continuing education. Jeff says it was in the late 1990s, early 2000s that he attended his very first National Comfort Institute certification class.

"My mother and brother had attended NCI classes prior to that, but after I took my first air balancing class, I came home and asked why we weren't looking at the ductwork?"

He says that prior to taking that class, all duct work was subbed out.

"After that class, I realized that doing duct work was not that hard. A light bulb went off and we began doing load calculations and Manual D-sizing so we could do our own ductwork. And we do it to NCI standards.

"This firmed it up in my head how important training is. It led to a mental-

ity where I'd rather hire a young, inexperienced person with a great attitude to work in the field. Then I can train that person on all the technical stuff. I am very big on that," Wheat says.

## TRAINING IS KEY

Today James A. Wheat & Sons is very big on the training front. As a Carrier Factory Authorized Dealer, he has access to great training opportunities for the mechanical equipment his company sells and installs. Many of his technicians carry NATE certifications as well as NCI certifications. The goal is to deliver installations and service well beyond code and customer expectations.

"To get there, I also do a lot of training with my tech people myself. I get in the truck and I go out with them."

In addition to managing the technical side of the business, Jeff is also the lead technician who is on call for whenever his field team runs into difficulties. He explains that he is the first person they call when there is a situation they cannot figure out. He'll try to talk them through it, but if that doesn't work, he goes to the job site to

help. He says he makes these callbacks teaching moments for the technicians.

"I want them to learn what they missed or how I came up with the solution. It's all on-the-job training.

"I am trying to get a stronger training program going where I do a class once a week on a topic. I haven't been able to get that off the ground because of time restraints, but that is something I'm shooting for," Jeff Wheat adds.

## ON THE PERFORMANCE PATH

Over the years Wheat and Sons has developed a reputation in the markets they serve for taking a static pressure reading on every job. Ever since taking the NCI training and earning certifications in residential air balancing and combustion performance/CO safety, Jeff requires his team "plot airflows, take temperature measurements at the equipment and registers, and check for carbon monoxide on every single job."

He adds that his salespeople also conduct those tests and measurements.

"Their conversations with customers always revolve around comfort: what areas of the house are too hot,



Jeff Wheat says, "There is nothing like seeing one of our well-equipped vehicles coming down the street."

first Star Wars movie hit the big screen and Jim Wheat was opening the doors to his new venture, a plumbing company that would eventually become a powerhouse in the local HVAC world.

In the beginning, the company was a one-man shop with Jim Wheat doing all the physical work and his wife working part-time helping with the



Jeff Wheat and his technical team celebrate with Comfort Consultant Manager Sara Morris, who was named the Company Employee of the Month for May 2018.

too cold, and so on," he says. "They explain that no house is supposed to have different temperatures through each level. The design is not supposed to be like that. And we can fix that.

"We got into home performance pretty heavily. Our team not only looks at making sure each room has the right number of grills and registers, but also we're concerned about losing air into the attic space and that air coming into the house.

"We talk a lot about humidity. It is amazing to me how many of our competitors don't talk about humidity. But here on the eastern shore, humidity is really what we need to control to make people comfortable."

This is stuff most HVAC contractors don't talk to customers about. Many

say they don't because of pushback by customers who don't understand why the cost is so high and other contractors don't even mention this stuff.

But the team at Wheat & Sons has been doing so for years.

"Our customers mostly don't push back," he explains. "They do ask why nobody else tell them about this kind of stuff. We explain it by telling our story. We also didn't look at it for a long time.

"Only after we learned how important it was and what it can do to the efficiency of the equipment. That is when we decided to learn more, get trained, and start addressing this. We find when we explain it this way we set ourselves apart from everybody else."

**STILL NAVIGATING THE PATH**

"Are we a full Performance-Based Contracting™ company the way NCI teaches it? Not yet. We have a long way to go," Wheat says. "The process doesn't come through every time. We talk about it in-house more than we used to. Our good competitors, who share the same markets with us, often tell me they wish they could get their field teams to take static pressure and other diagnostic measurements the way we do. That is a big step for us. We are working on following the process on every sale, but we aren't there yet. One step at a time."

But Jeff is very positive about the ramifications of Performance-Based Contracting on his business. He says the training and certifications from



James A. Wheat & Sons partnered with Thomas Edison High School in 2017 to help educate future HVAC technicians.

"My plumbers check CO on every job too. There is no other plumber around here that is doing anything like that.

"The bottom line, our affiliation with NCI sets us apart from our competitors and makes us a much better company."

**MESSAGE TO THE INDUSTRY**

Jeff Wheat says that doing things right the first time isn't easy. He says it takes commitment, enthusiasm, training, and having the right attitude to be successful.

"It is a great industry when you learn the basics, understanding it, and apply it. The skills we have can be applied anywhere in the world. We need to explain this to young people and get them

excited about joining this industry.

"We need them to understand they will always have a job, even if they decide to leave the U.S. They can work doing HVAC anywhere in the world. Everybody has to deal with temperatures and comfort in homes and buildings. It is a no-brainer.

"And you can make a great living at it. But the key is education. Not only from trade schools, but through training, by reading HVAC equipment manuals, trade magazines, joining forces with organizations like NCI. It will make you a much better technician, manager, and contractor."

Congratulations to Jeff Wheat and the team at James A. Wheat & Sons for being the July 2018 Contractor Spotlight.

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# Surface Temperatures Can Reveal Elusive Comfort Problems

Performance-based contractors pride themselves on making sure their customers are comfortable. However, situations happen where you've done everything by the book, yet your customer is still uncomfortable. These can be the most frustrating and defeating situations you encounter. You gave it your best shot and it appears you came up short.

You designed and installed your best HVAC system. The equipment is operating according to manufacturer specifications and sized according to industry best practices. Your duct system is awesome. It's installed correctly, no duct leakage, insulated with the highest R-value insulation you can find, and delivering proper airflow to each room. How could a customer be uncomfortable with an HVAC system like this?

Room temperature on the thermostat display is one of the main measurements your customers use to gauge their comfort. If it is within an acceptable temperature range, they should be comfortable, right? Not always. Let's look at a couple of factors external to your system that influence comfort and how you might be overlooking them.

## AIR TEMPERATURE LIMITATIONS

Air temperature is one measurement used to verify proper HVAC system Btu delivery. When the difference in two air temperatures are compared it is called Delta T ( $\Delta T$ ). If Delta T is within acceptable limits, and airflow is correct, odds are pretty good your HVAC system is operating as designed.

One factor affecting comfort beyond system performance is the influence of the building. When everything looks right with the HVAC system, change your focus to the building itself to find potential answers.

## LOOK AT THE BUILDING

For an HVAC system to function properly, airflow and temperature must be controlled inside the duct system. If control of either is lost due to duct leak-

age or poor insulation, the system will fail to operate as designed.

The buildings your customers live and work in are impacted the same way. When airflow and temperature constantly change throughout the building, it's hard to maintain comfortable conditions. Two factors that influence this include building air leakage and insulation.

Just as Delta T is a factor of HVAC system performance, it also influences buildings. Instead of looking at air temperatures from the HVAC system, building Delta T compares surface temperatures and indoor ambient temperatures. The larger the Delta T between building surface temperatures and indoor ambient temperature, the harder it is to maintain comfort.

## AIR LEAKAGE INFLUENCES

Air leakage in a building increases the Delta T between building surface temperatures and the indoor ambient temperature. When air moves from unconditioned to conditioned areas, heat transfers. As a result, building surface temperatures increase in summer and decrease in winter leading to increased customer discomfort.

Please note: this can occur even when insulation is installed correctly. If the building isn't properly sealed, air will "bypass" insulation like it isn't there.

If you see fiberglass insulation that is dirty, it's a sign air is moving through it, reducing its R-value. Remember this next time you consider recommending additional insulation. Other repairs might be needed first.

## INSULATION INFLUENCES

When insulation is poorly installed, or insufficient, building Delta T also increases. As it increases, so do discomfort levels. This occurs regardless of thermostat settings.

Glass areas purposely have no insulation. Yet, win-

◀ Poorly installed insulation allows heat to easily bypass it.

dows, doors, and skylights have a tremendous effect on customer comfort. You need to understand that effect and deal with it since glass significantly contributes to increasing the Delta T between building surface temperatures and indoor ambient air.

Think back to the last time you sat next to a window on a cold winter day – consider how you felt. You may have caught yourself shivering and then bundling up. Are you starting to make the connection to comfort?

## RADIANT HEAT TRANSFER

When you lose body heat too quickly, you become uncomfortable and start looking for ways to warm up. You'll often put on additional clothing or turn up the temperature on the thermostat.

On the flip side, when you lose body heat too slowly, you also become un-

comfortable and start looking for ways to cool off. This typically means turning on a fan or turning the temperature down on the thermostat.

Uncontrolled building air leakage and insulation affect your comfort due to how your body loses and gains heat. The main way this occurs is through radiant heat transfer. Your body gains heat from any warmer surfaces and loses heat to any cooler surfaces. Remember the example of sitting next to a window on a cold winter day.

To achieve ideal comfort conditions, building surface temperatures should be very close to the thermostat temperature setting. If surface temperatures and air temperatures are close, Delta T is minimized, and comfortable conditions can exist. If the surface temperatures of the building vary too far from the air temperature, radiant heat transfer becomes too fast or too slow. This is when it becomes harder for you to maintain comfortable conditions, regardless of how well your HVAC system performs.

Mean radiant temperature (MRT) is one measurement used to quantify this interaction. It measures surface temperature effects on living areas.

MRT is measured with a special thermometer that looks like a black globe and accounts for building surface influences on comfort.

Thermal imaging cameras are another valuable test instrument for identifying surface temperature issues that affect customer comfort. Using a blower door

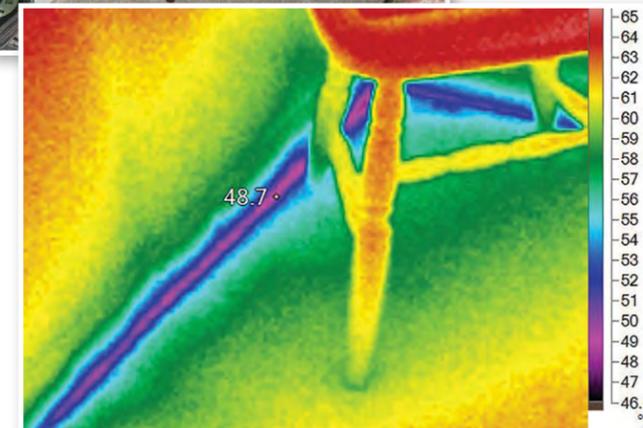
with a thermal image camera is a great way to show how much air leakage and surface temperatures affect each other.

## CONTROLLING BUILDING INFLUENCE

Let's say you use a thermal imaging camera and measure a floor temperature of 63F. This will have a huge impact on comfort and could be accompanied by cold floor complaints. Imagine how much more comfortable it would be if the floor temperature was 73F. No more complaints of cold floors and freezing feet.

Comfort requires maintaining building temperatures in a way that keeps customers from either freezing or burning up. Unless you address the HVAC system and the building, you'll miss opportunities to truly solve these problems and provide a comfortable environment.

When you understand these variables, you can then create a thorough scope of work that addresses underlying issues, not just symptoms. Even if your company doesn't engage in building air-sealing and insulation work, you can confidently address the problems affecting comfort and recommend next steps for real solutions. 



Infrared temperature measurements reveal hidden comfort issues. Cold floors were the result of this problem due to air leakage and a uninsulated concrete slab



**David Richardson** serves the HVAC industry as a curriculum developer and trainer at National Comfort Institute, Inc. (NCI). NCI specializes in training focused on improving, measuring, and verifying HVAC and Building Performance. If you're an HVAC contractor or technician interested in learning more about HVAC system statistics, contact David at [davidr@ncihvac.com](mailto:davidr@ncihvac.com), or call him at 800-633-7058.



## HIGH PERFORMANCE CONTRACTING: Summit 2018 Panel Discussion on Implementation [PART 1]

Nothing worth doing is ever easy. That may be a cliché, but it is so very true. Becoming a Performance-Based Contracting™ company is NOT an easy thing to do. If it was, everyone would be doing it, right? And yet there are many HVAC contractors who have successfully implemented the performance concepts into their business cultures, their service mindset, and the work they provide customers.

During the 2018 National Comfort Institute (NCI) Summit in Austin, TX, we gathered together a panel of six of these contractors to share their struggles with implementing performance into their companies and how they overcame them. Facilitated by NCI CEO and Chairman Dominick Guarino, panelists interacted with the attendee audience to create a dynamic program of sharing on not only how to overcome the hurdles to implementing performance, but their success stories as well.

The panelists included the following Performance-Based contractors:

- **Jim Ball**, Ball Heating & Air, Biloxi, MS
- **Tom Johnson**, TM Johnson Bros, Cambridge MN
- **Nancy McKeraghan**, Canco Climatecare, New Market, ON
- **Jose Montes**, Kennihan Plumbing, Heating & AC, Valencia PA
- **Kevin Walsh**, Schaafsma Heating and Cooling, Grand Rapids, MI
- **Paul Wieboldt**, Tradewinds, AP, Waco, TX.

The comments and discussion have been divided into eight sections (not necessarily in the order they were delivered) to organize this in a more useful way for our readers. The sections are as follows:

- Getting Started in Performance
- Moving Forward
- Processes
- Technology Concerns
- Training
- Recruitment
- Keeping Score
- Promotion and Marketing.

So, without further ado, here is the discussion on how these contractors overcame hurdles and achieved success in implementing Performance-Based Contracting™ into their companies.

### GETTING STARTED IN PERFORMANCE

*It is always difficult to get started. The high performance path is a big one and sometimes the hardest part is taking that first, little step to get started.*

**Q:** **Jonathan Esquivel** from Austin Star Services, Austin, TX asks, “I am a first-generation owner/operator struggling with doing everything to keep my company running. I want to start implementing performance, but just don’t have the time. How can I get people who can help me move into that next step of running a business – working on it, not actually in it.”

**A:** **Jim Ball:** Even though I am the second generation doesn’t mean I wasn’t around to see the struggles the first generation went through.

My dad started the business in 1964 and I was born in 1969. During the 1970s Dad was on the phone every night when he got home from work. He’d be on that phone all night long talking to builders, trying to collect money, and more.

Finally, in the 1980s, we realized that new construction wasn’t going to cut it for us. He made a decision and committed fully to going into the



### Meet the Panelists

**Jim Ball** is the general manager of Ball Heating & Air, a second-generation business with 30 employees that focuses only on the residential service and replacement market. His technicians average two to three hours per call. He has been a member of NCI since 2002-2003.



**Tom Johnson** is the general manager of T.M. Johnson Co. The firm has 14 employees and does around \$2.4 million in sales. They do both HVAC and plumbing work, focusing on the residential service-remodel-retrofit marketplace. Carbon monoxide and combustion analysis is core to what they do. They started with NCI in 2008 and Tom says, “NCI has revolutionized how we go to market and deliver quality products to our customers.”



**Nancy McKeraghan** and her husband launched their company in 1984. They are considered unusual in their marketplace because they focus on providing solutions to customer comfort problems while competitors install boxes. She says that “customers who have experienced our installations and processes appreciate the things we do. I thank NCI for helping us to be aware of performance-based contracting.”



**Jose Montes** is the office manager for Kennihans Plumbing and Heating. Owner Bill Kennihan started the company in 1969. The company does HVAC, plumbing, geothermal, and hydronic work. They focus on doing Performance-Based Contracting™. Montes says, “We educate ourselves as company managers and as employees. We also educate our customers, so they understand what we are doing while in their homes.”



**Kevin Walsh** is the president of Schaafsma Heating and Cooling. The company began in 1905 and joined NCI in 2003. Schaafsma does just under \$5 million in sales, has 35 employees, and focuses on residential service/replacement. This includes forced air, boilers, geothermal, duct sealing, duct renovations, and more. He says they are still working on performance implementation, but consistently test in and test out on jobs.



**Paul Wieboldt** has been in the HVAC business for 25 years. In 1993 he started Tradesman Heating and Air Conditioning. After 10 years, he felt he wasn’t designing and installing the best HVAC systems. Paul joined NCI in 2003 and discovered what was missing: Performance-Based Contracting, measuring, and verifying. The company was so successful doing that, Paul started a separate Testing and Balance company.

residential replacement and service business at a time when we were almost out of money and out of business.

You have to make your mind up and do everything you can to remain committed to the result you want. Not only about what markets you serve, but how you serve them. It won’t be easy.

We have the opportunity to change people’s lives every day. It’s a privilege that’s been bestowed upon us and we often take it for granted. Not only in terms of customers but also with regard to those who work with us.

It’s our job to help move those people forward. Let them see what our goals are. To do this requires effective communication of those goals every day.

**Mike Greany**, All Pro Plumbing, Heating, Air, & Electrical, Ontario, CA: I gree with what Jim says.

I started my business by myself as an owner/operator and its only technician. I ran it successfully for 10 years.

Part of that was because I belonged to associations with similar business interests and that had people there to help me. At the end of the day, I sold that business for a profit and took a bigger path with the company I work for today.

In my opinion, the best thing you can do is join an association like THIS association. NCI members have already faced the struggles you’re facing. You can call anyone in this group for advice and help.

### MOVING FORWARD

*Once you begin down the performance path, it becomes a matter of doing what it takes to keep heading in the right direction. Which is what lead to this question.*

**Q:** **Dominick Guarino:** Please share with us how have you moved forward in your implementation process

since the last Summit you attended?

**A. Ball:** We always do static pressure testing after every changeout. We have now taken that a step further by doing the reports. Not a big step, but it is helping.

**Jose Montes:** One of our biggest issues is with staffing. Last year we hired several new people. Performance training has been continuous for our new crew and all our other co-workers.

It's unfortunate, but when we hire new people, we need to start from ground zero in training them. It doesn't matter if they have HVAC experience or not – they just don't know anything about performance.

They also know next to nothing about combustion or airflow, so we train them in those disciplines as well.

The good news is that our core technicians DO understand it, so they share what they know with the new hires. That means it's not just management pushing performance. The employees are a great help as well.

**McKeraghan:** One of the things I've learned in the past year is that we have two types of customers: internal and external ones. We tend to take excellent care of our external customers. After all, they pay our bills.

But we often forget about internal customers – our employees. We tend not to think of them as customers. But they are. They are part of the process. So we needed a cheerleader.

When I attend training or events like Summit, I bring my sales manager – Will Horner – along with me. That way, he knows what I know, and he gets all fired up. When we get back to the office and find our performance culture wandering off the trail a bit, he

reminds me, and we get back on the trail. And I reciprocate that with him.

**PROCESSES**

*Performance-Based Contracting involves using processes – technical ones in the field, management ones in the office. This section revolves around how to get technicians and installers active in doing static pressure testing before and after working on a job as well as some details on very specific service/maintenance processes.*

**Q. Ed Barrett,** Barrett Heating and Cooling, Alton, IL: I am curious how you get your techs to take their time and do the static pressure and other measurements during the height of winter or summer busy seasons?

**A. Montes:** We look at our invoices daily. There better be some airflow and combustion numbers in there. Otherwise, we have a conversation. Daily. Until they understand.

This isn't negotiable. It doesn't matter what time of the year it is. It has to be part of the invoice.

**McKeraghan:** Our technicians get \$5 more for every job they do that includes a diagnostic or maintenance. When the tech looks at how much more money they make when they do these things, they can see I'm serious.

**Tom Johnson:** It needs to be a big cultural thing in your company – from the call-taker all the way down. At our company, the technicians are assigned one call at a time. When they finish that one, they get the next one. They don't know how many calls they have that day or any day.

We try not to give them too many



calls each day because we don't want to run them ragged. This is a long-term culture shift. It means building a good, strong maintenance base, and doing maintenance right so you don't have summer or winter breakdowns from that base. Bottom line – you can't take every call.

**Q. Dominick:** What Tom is saying is you have to prioritize. Static pressure measurements should be part of your standard maintenance call. It is a priority thing. It is a maintenance thing. And it is not optional.

Another obstacle to implementing is getting your salespeople on board. I typically hear contractors from all around the country say things like, 'My salespeople are doing well, they are selling more than \$1 million a year, so why should they change?'

So, what have you found that works to help get over that hurdle with the salesperson?

**A. McKeraghan:** We've struggled with this for a long time. One thing that really helps is Rob Falke's chart that compares static pressure to blood pressure. For the first time, we have something we can take to customers and share the information we collect from their equipment in terms they can understand.

Once salespeople had that tool, it became much easier to not only get them on board, but it helped get the customers on board as well. Up to that point, we were the only company talking about performance, statics, and air upgrades. Nobody knew what

we were talking about.

Another thing that solidifies salespeople doing performance testing is that we get our customers involved in the sales process. Customers will hold the Magnahelics and read the numbers off and become integral to the overall sales process.

Our sales manager did this first. When he became successful at it, the other salespeople wanted to do the same thing.

In other words, you need a crusader – someone who will take it and run. You also need to provide your salespeople with backup, with the tools they need to take them through the entire process.

Also, NCI has this wonderful batch of consumer pamphlets, one of which describes the six-step process which we use all the time and find very useful. The others define static pressure and describe what air balancing is and so on.

That's called third-party verification. It's not us saying it. It's a nationally recognized third party.

These are some of the things that help us be successful getting our salespeople onboard and educating our customers.

**Kevin Walsh:** We did some of the same things Nancy did. In addition, we used an incentive approach where we paid our salespeople a 15% commission on every duct renovation job they sold. Our salespeople are a little like air – they choose the path of least resistance. We needed something to

divert them to the harder path.

Today we are back to a set, straight commission on that. But they are still looking at the ductwork and selling renovations on it because they find it helps to separate Schaafsma from our competitors. That helps them sell more jobs.

**Paul Wieboldt:** I learned from years of trial and error and overcoming the mistakes I made. It led to a policy that said we either make money or pay tuition for the work we do.

When we made a big mistake because we weren't sure what to do, I would stop everything and bring together my team – several vans and all our tools – to the house with the problem. We'd spend the day figuring it out. We'd bring in lunch, entertain the customer, show off all the cool tools we had, and solve the problem on the spot that day.

We used the opportunity of a mistake as a teaching moment. To let everybody see what we did wrong and how we fixed it. We then asked those customers to tell the story of how badly we messed up and what we did to make it right.

Two things happened. These folks became our cheerleaders. And new customers were both shocked and impressed that we'd tell them to call previous customers where we made a huge mistake. They'd learn how those mistakes led to the biggest improvements. Plus it showed my staff that I was 100% behind them. That we would always spend whatever it took

to make it right. For us, this approach helped overcome a lot of obstacles.

**Q. Eddie Lammers,** Honey Home Services, Winter Park, FL asked the panel, "I am interested in hearing about your process for cleaning condenser coils, indoor evaporators, blower wheels, and your ballpark charge for that."

**A. Ball:** We started by asking our guys how they would like their systems done in their own homes. Their answers became our procedure. That was 20 years ago. We modify the procedure and regroup on it routinely.

We do clean the evaporator and condenser coils on every visit. We pull the blower and remove the motor from it and clean it. This takes a lot of time. When finished, we wax the unit down and make it look brand new.

By the way, we test-in before we start and test out when we are finished to make sure statics are all good. Then we go through everything with the customer. We make sure they are satisfied and that we've answered their questions.

Regarding charges, I find that I need 70% or so to operate that department. That is seen in my pricing and we are pretty expensive. 

*This ends Part One. Next month we will continue the Summit Panel Discussion and will cover the sections on Training, Recruitment, How to Keep Score, as well as How to Promote and Market Your Performance-Based business.*

Your key to success in Performance-Based Contracting™ is a strong support network – always there when you need it. NCI helps its members overcome the typical hurdles associated with implementing the measured performance approach.

<b>Membership Options:</b> Turbocharge your membership with added learning opportunities and financial incentives.	 High Performance HVAC Alliance	 Learning Excellence Premium	 Learning Excellence Live	 Learning Excellence Online	 Basic Membership
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Unlimited Webinar Access	✓	✓	✓	✓	✓
Bonus Annual NCI Training Bucks Earned	\$4200	\$4200	\$4200	\$1200	✓
ComfortMaxx Pulse™ - Air & BTU Testing Software	✓	✓	✓	✓	✓
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## Join NCI Today!

The ABCs of High-Performance HVAC Contracting: **PART 1**

## What Is High-Performance HVAC and Why Do it?

If you're on the fence about making your company more Performance-Based, this multi-part series can provide a lot of information to help you decide whether to invest in this innovative approach.

This series can also serve as a good refresher for those who have already embarked on the journey, but perhaps are not moving as fast as they want. Or it can serve those who have not been able to implement it as successfully as they would like.

More than 15 years ago National Comfort Institute (NCI) coined the term, "Performance-Based Contracting™" to describe a different way of going to market. How was it different? Performance-Based Contracting revolves around testing pressures, airflow, and temperatures.

After testing and diagnosing a system you can provide a delivered efficiency score to help your customer understand how well their system is performing and how you can improve it.

### THE GENESIS OF HIGH-PERFORMANCE HVAC

The Performance-Based approach didn't happen overnight. It's the result of a buildup towards delivering true system performance that began more than 25 years ago. I personally wrote about the early signs of this shift back in 1992 as chief editor of an HVAC industry magazine in an editorial titled, "[The Comfort Revolution](#)."

In the editorial I challenged the industry's narrow focus on just selling energy efficient equipment.

This paradigm resulted from the energy crisis of the late 1970s into the 1980s.

The article called for a shift back towards what our industry is all about in the first place: to keep indoor spaces comfortable year-round. The piece described how the industry had been derailed from its focus on comfort, health and safety, and became virtually obsessed with "energy efficiency." And even at that, the focus was erroneously on "box" efficiency, namely SEER and AFUE, which only plays a part in true "delivered" efficiency.

### EQUIPMENT VS SYSTEM EFFICIENCY

Our industry's "equipment efficiency" focus continued into the next two decades, and is still

Equipment efficiency and system efficiency are not the same thing. If you only check the equipment, you're ignoring the air delivery system and that will negatively impact "delivered" efficiency.



prevalent today. Manufacturers continued to produce higher efficiency equipment, which is what you'd expect them to do. However, most contractors did not step up their game to improve "systems" to make the most of that better equipment.

As manufacturers strive toward even higher efficiency ratings, some have kept up the quality of their equipment. They've done this with robust motors and fans that handle the higher static pressures created by more restrictive "high efficiency" evaporator coils, denser air cleaners and filters, and undersized ductwork.

Some however, still skimp on the capacities of their fans to keep perceived energy use down so they can meet AHRI SEER ratings. This makes it virtually impossible for many systems to deliver optimum comfort and energy efficiency.

With 13-14 SEER as the minimum efficiency standard (depending on region) for central air conditioners and heat pumps, there's very little differentiation based on "box" efficiency in the eyes of the consumer. Consumer sales pitches based on "Return on Investment" (ROI) and payback from higher SEER equipment are less effective as contractors become hard-pressed to justify the extra cost.

**REAL DIFFERENTIATION**

High quality workmanship can be a significant difference between contractors bidding on a job. But everyone claims they do high quality work, right? Don't you?

So how do you differentiate yourself in this fast-changing environment that makes differentiation tougher than ever? What's the next frontier? How can you prove to a customer you

are truly different?

Here's how: provide them with documented and measured performance readings before you get the job and after the work is completed.

After all, if you don't measure, you're just guessing!

The process is fairly simple: teach your customers about their systems in simple terms, pointing out real problems. Then "prove" your work is superior through documentation.

What's interesting about measuring and delivering system performance is it allows you to truly do just that: deliver the best system with optimized safety, comfort, and energy efficiency. There's no need to compromise any of these three components of system performance to achieve one or both of the others.

As you read this series, it will become clear that your customer can have it all, and so can you. Performance-Based Contracting can also provide the double-digit net profit margins you deserve and need to be successful over the long run.

**WHAT IS HIGH-PERFORMANCE HVAC CONTRACTING?**

Although many aspects of High-Performance Contracting involve changing the very core of how an HVAC contractor does business, the basic premise is: **Deliver Measured Performance.**

If this was all you had to know, this article would end here and you could implement this concept and become tremendously successful. If it were that easy, everyone would be doing it and it would become a commodity in no time. Fortunately for you, it's not that simple.

High-Performance Contracting involves a series of significant changes in how you manage and operate your contracting business. Sure, the technical aspects of delivering measured performance are important and critical, but the technical side is just one facet of this approach.

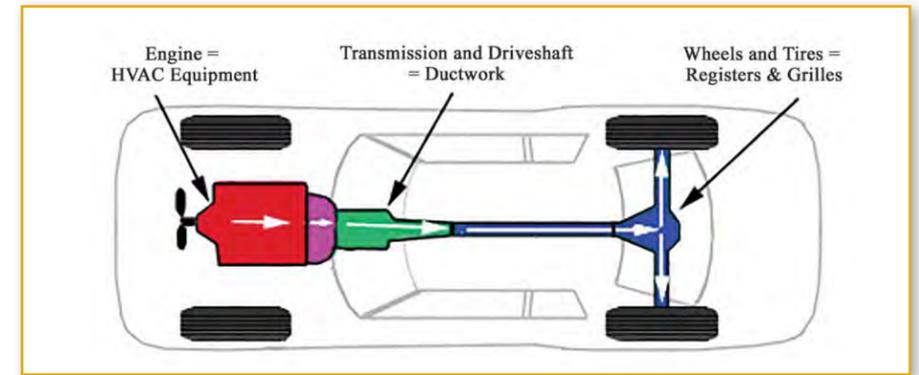
**THE COMPONENTS OF HIGH-PERFORMANCE CONTRACTING**

Let's break down some of the basic precepts of High-Performance Contracting to better explain the culture change needed to effectively transform an organization into a Performance-Based business.

On the technical side, it requires in-depth knowledge of true HVAC system performance, from how you field-design your systems, to how you install and test them to make sure they safely and efficiently deliver the comfort you promised. This also applies to how you service and maintain systems as well. To become Performance-Based you must pull your head out of the box and look at the entire system, from the equipment to the duct system, to the grilles and registers that deliver air into the space.

**EQUIPMENT PERFORMANCE**

From an equipment perspective, performance entails proper sizing and installation. It requires understanding fan characteristics and the effects of coils and filters on air flow. In addition, it means properly charging the refrigerant side of the system once you have corrected air side problems. This requires checking and adjusting important readings like superheat and subcooling for optimum equipment performance.



Using a car analogy to explain how an overall HVAC system works helps customers to better understand their system and be more open to upgrades and repairs.

High-Performance Contracting also requires a better understanding of combustion from three aspects: Safety, as it relates to the dangers of carbon monoxide; Efficiency, as it relates to getting the most BTUs from the burners transferred to the air stream; and Comfort, as it relates to maintaining warmer discharge temperatures.

But that's only the beginning. To become Performance-Based, you need to understand that the equipment — air handlers, furnaces, and condensing units — are just components of a system, not the system itself.

**AN AUTOMOTIVE ANALOGY**

Comparing an HVAC system to an automobile can be a very powerful analogy — especially for customers.

The equipment (air handler, furnace, condensing unit), is similar to the engine that powers the vehicle. It's the heart of the system. The transmission can be compared to the duct system. The wheels can be compared to the grilles and registers.

Unless you have a properly working transmission, along with good wheels and tires, you won't get the mileage and performance you expect from your car. In fact it may not work at all.

An auto transmission is much like an air distribution system — it delivers the power from the engine to the

wheels. The duct system delivers the cooled or heated air from the equipment to the grilles and registers, and ultimately into the spaces you want to make comfortable.

As you begin to truly look at system performance in a different light, you'll come to understand that our industry has missed the mark for many decades, as we've been led to believe that equipment alone delivers performance and comfort.

We've also been led to believe that if you design a duct system according to industry standards, it will work without testing or adjusting.

High-Performance Contracting essentially helps you get back to the roots of what your company is in business for in the first place — to deliver optimum indoor comfort safely and efficiently.

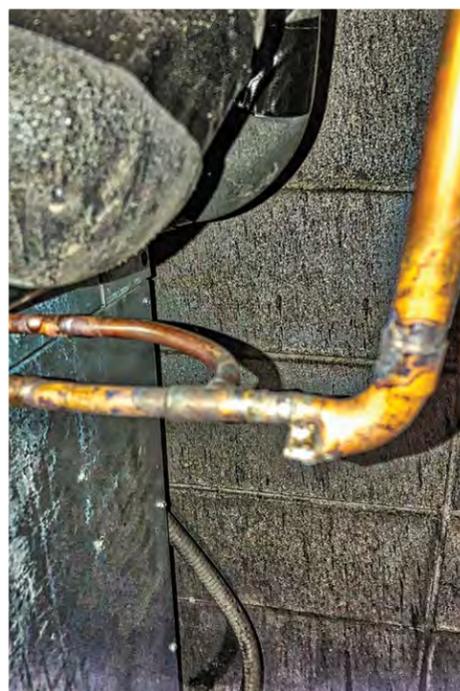
Be sure to look for the next installment in this series where we will explore the steps needed to move an HVAC contracting business into the High-Performance zone. 



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



If you don't measure, you're just guessing. Customer involvement in the testing process helps separate Performance-Based Contractors™ from their competition. It also helps close more sales!



### “High Bill Complaints”

— Jamie Clark, Synergy Home LLC, Lexington, KY

Clark says he found this 10-ton Daikin heat pump paired to an air-handler with two five-ton coils. The equipment was just installed last fall and the owner called me because of high bill complaints! Can you say “Bad” category?

Jamie Clark from Synergy Home LLC is the July 2018 winner of our Photo-of-the-Month contest, as voted on by the subscribers to the [High Performance HVAC Today magazine](#) and visitors to the website. He will receive a \$50 gift card.

You can too – submissions are always welcome. If you’d like to submit a photo for consideration in our Photo-of-the-Month contest, go to [ncilink.com/POMSubmit](#) and fill out the information as requested.

#### THE AUGUST CONTEST OPENS ON JULY 9, 2018.

That gives you plenty of time to submit something in any of our three categories: **The Good , The Bad , WTH (What the heck).**

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# Providing equipment at a substantial savings, and without an extensive delay

When distributors of HVACR equipment have surplus equipment, they often look for ways to turn that equipment into cash, rather than let it languish in inventory. Often those distributors call Lazco Corp. of Scottsdale, a company that’s been buying and selling surplus HVACR equipment for 30 years.

Lazco Corp.’s core business is buying and selling HVACR equipment, parts and compressors, new, surplus or used, in global air conditioning markets.

Steven Lazar, Lazco Corp.’s owner, pointed out that while contractors generally don’t stock HVACR equipment, distributors do, and sometimes their warehouses get full of too much equipment.

“We help to clear up warehouse space for them,” Lazar said. “We are the way they can take their surplus equipment and turn it into cash because we provide the assistance to move their equipment out of their warehouses.”

Lazar noted that often Lazco Corp. will take surplus equipment in Arizona and move it to a state like Michigan, “where you still can sell a 13 SEER unit,” he said. “Or we might send the surplus equipment to Miami, where it will then be shipped to South America.

Lazar said that some of the area distributors Lazco Corp. works with include Phoenix Wholesale, Rheem, Nordyne,

Sigler Wholesale Distributing, and Ferguson. He pointed out that his typical inventory usually includes Trane, Carrier, Rheem and York rooftop units, Napoleon/Goodman Manufacturing units, name brand mini splits, chillers, boilers, generators, compressors and controls.

“We like to ship direct from the source, whether a distributor or manufacturer, to our customer, wherever they might be in the world,” Lazar said. “Our goal is to take the surplus inventory from one area, and move it to a part of the country where it can be sold.”

Lazar cited as case study a client in Florida. He said the client, a hospital, found Lazco Corp. online ([www.lazcorp.com](#)) and advised that it needed to replace a 400 ton chiller that had gone down. The hospital wanted a replacement as soon as possible.

Lazar said that a manufacturer quoted the hospital \$140,000 for a new chiller and a nine week delivery time. Lazco Corp. sold the hospital a new 400 ton water cooled screw chiller for \$66,000 and delivered it in three days.

“We were able to provide them equipment at a substantial savings,” he noted, “and without an extensive delay.”



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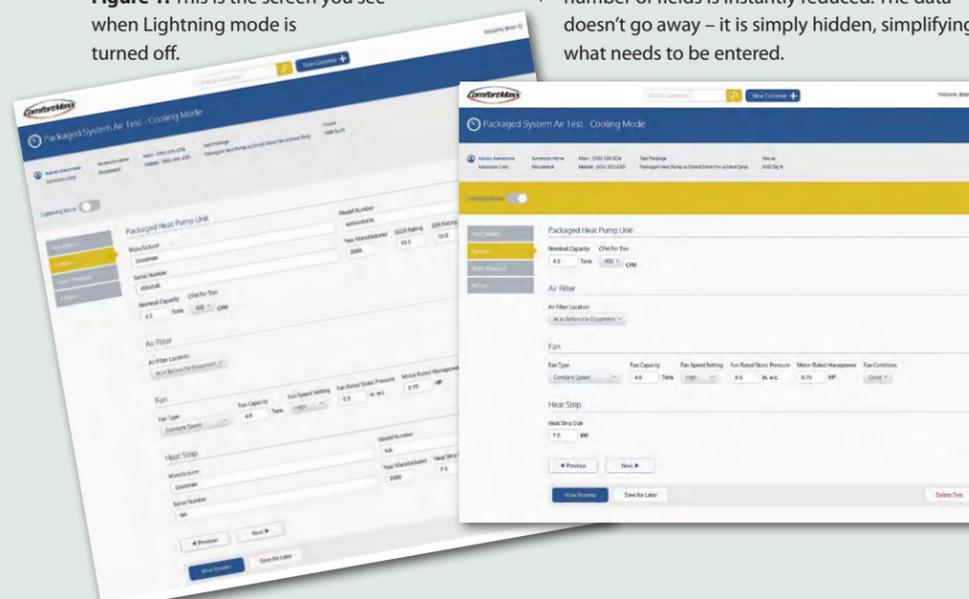
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**INTRODUCING COMFORTMAXX LIGHTNING**

We are excited to announce a brand new ComfortMaxx feature called "Lightning Mode." Lightning mode employs a simple switch that allows you to view ComfortMaxx screens showing the bare minimum fields needed to perform testing, diagnosing, and rating systems at lightning fast speed.

**What is "Lightning Mode"?** It is a simple toggle switch that clears the page of any non-required fields, leaving only what is necessary to move forward in the direction of completing a ComfortMaxx Test.

**Figure 1:** This is the screen you see when Lightning mode is turned off.



**Figure 3:** This is the accounts view in ComfortMaxx with the Lightning mode off.

To show the fields again, simply toggle Lightning Mode OFF.

◆ Lightning Mode makes the process of Creating Customers, Locations, and Systems quicker and easier by simply hiding any input fields that are not essential to the process.

◆ Lightning Mode streamlines the Test Input process as well by hiding any non-required fields in the Test Input Screens, reducing the number of steps necessary to get to insightful ComfortMaxx reports and calculations.

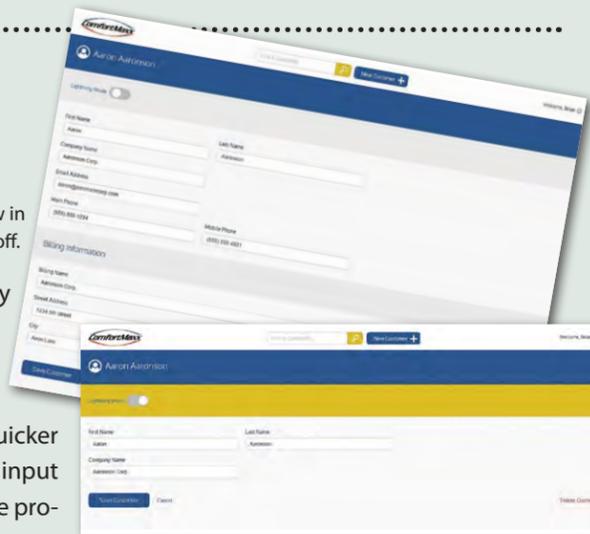
**How do I get started?** -- To experience the Lightning Mode in ComfortMaxx, you need to login to your ComfortMaxx account as an administrator or a user. Your field people who are NCI certified can use their Comfortmaxx login to immediately experience lightning.

To test in Lightning Mode:

◆ Click "New Customer" in the top right-hand corner of the page.

◆ Click "Lightning Mode" to toggle it. If you turn it on, Lightning Mode will be engaged for any subsequent page you visit that is "Lightning Enabled" (You can also

**Figure 2:** When you toggle Lightning on, the number of fields is instantly reduced. The data doesn't go away – it is simply hidden, simplifying what needs to be entered.



**Figure 4:** With Lightning toggled on, this is the accounts view. Simpler. Cleaner. Faster to fill out.

turn it off at any point). Lightning Mode will keep its ON/OFF status even if you switch from your computer to your smartphone in the middle of the process.

◆ Keep Lightning Mode ON and create a Customer, then a Location, then a System.

◆ Now click "Start Test" on the Customer's show page. Select a test.

◆ Once you're in the Test Input Screen, you'll see most of the effect of Lightning Mode when you're viewing the "System" tab. Go to the "System" tab and toggle Lightning Mode on and off to see the difference. You can do this on any page. It will not change any data, it simply hides the non-mandatory fields!

◆ If you want to view an existing test that is still in progress in lightning mode, just navigate to that test and you will see the Lightning toggle in the upper left-hand part of the page.

That's it! There is nothing to download or change in how you use Comfortmaxx – it just got a lot easier and gives you complete control of using in Full mode or Lightning Mode.

If you have any questions about Lightning, Comfortmaxx, or any of NCI's software products, or need help with passwords, adding users, etc., be sure to contact Customer Care at 1-800-633-7058, and we'll be glad to help you get started.

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