

HIGH PERFORMANCE HVAC TODAY™

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

AHR EXPOSITION ISSUE:

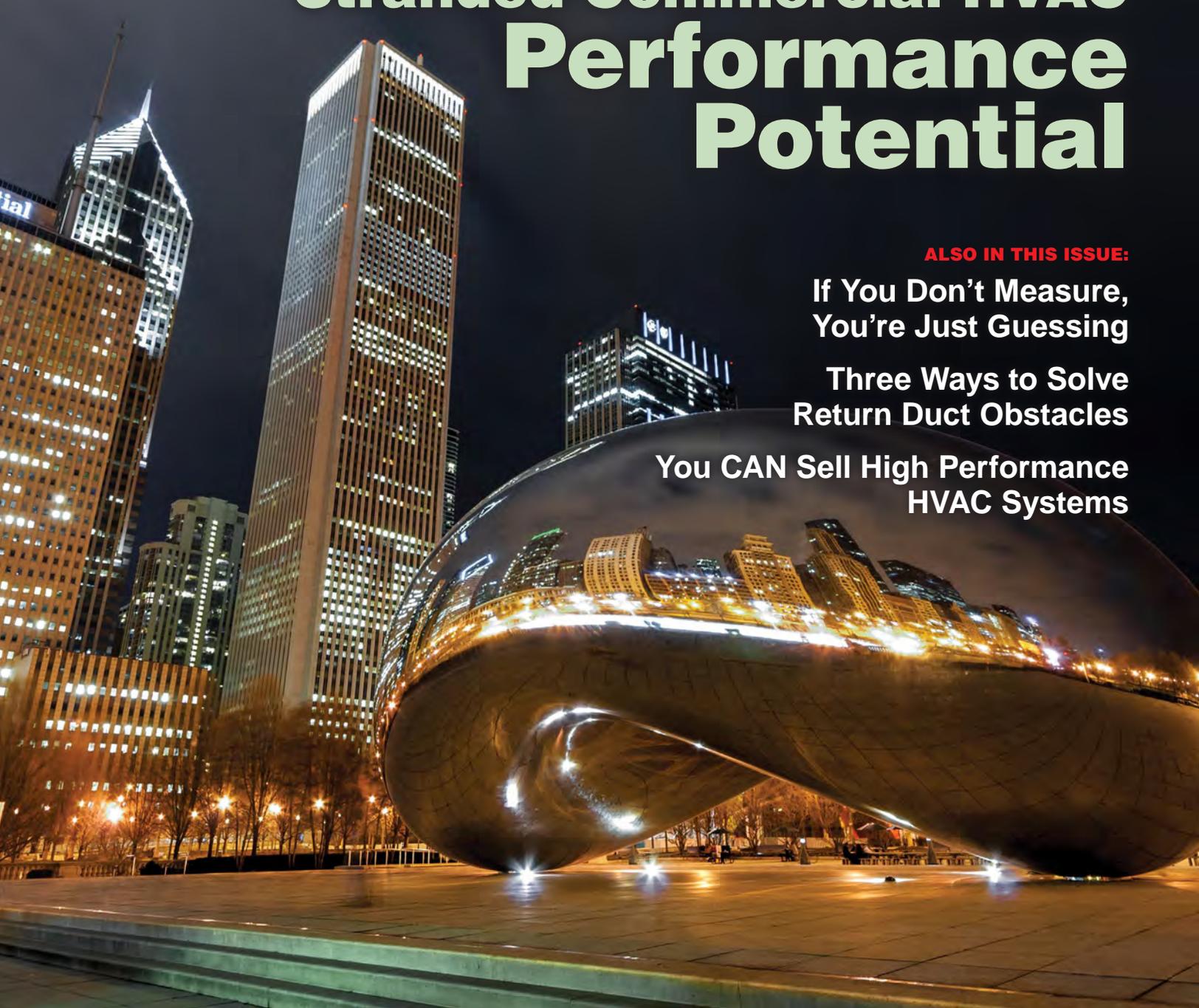
Stranded Commercial HVAC Performance Potential

ALSO IN THIS ISSUE:

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

**Three Ways to Solve
Return Duct Obstacles**

**You CAN Sell High Performance
HVAC Systems**





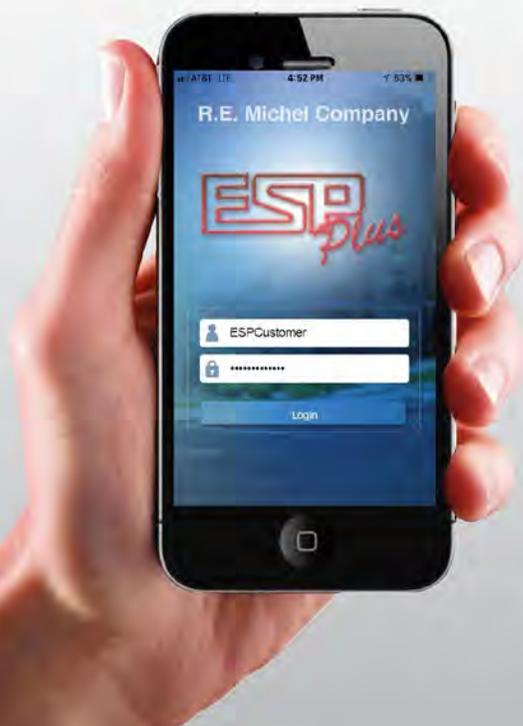
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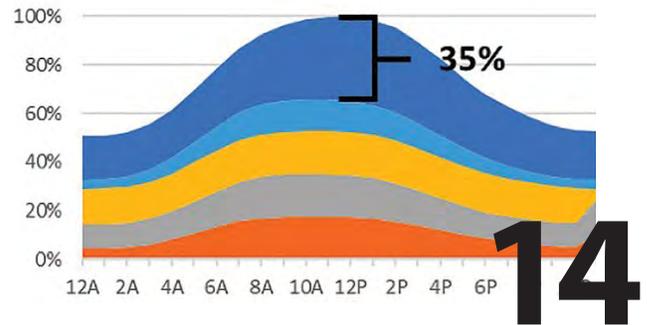


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Measure, Don't Just Guess

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Monthly Download



This Tech Tip helps you understand when, where, and how to use a field correction factor when measuring airflow. It is for those using the 801 rotating vane anemometer. This one-pager is very handy for technicians who encounter building supply registers that are inaccessible to a balancing hood.

This download is a checklist for measuring airflow and calculating the correction factor.

Go to ncilink.com/md0118, or use your phone with the QR Code below.

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



Online University

Featured this month is the *Estimating R-Value and Calculating Heat Loss or Gain* module. This course is designed to help you learn the best methods for estimating insulation R-Value, then calculating either the heat gain or loss through an external wall.

You will learn about the three R-Values tests and the associated calculations for each of them. In addition, we will demonstrate how to plot R-Value on the R-Value Estimation Chart.

This course is part of National Comfort Institute's Advanced Technical Training Series that includes 12 multi-part modules.

Learn more about this course in particular and the Online University in general by following this link: ncilink.com/ou0118



Blaze Your Trail to High Performance

with Help from these Industry Pioneers:



John Ellis
President,
SoCal Air Dynamics, Inc.

SESSION:
Where Indoor Air Quality Meets System Performance



Tom Johnson
President & GM,
TM Johnson Bros., Inc.

SESSION:
Became Your Local Carbon Monoxide Evangelist



Nathan Copeland
Comfort Advisor, Copeland & Son AC & Heating Service, Inc.

SESSION:
ComfortMaxx Air: Put It to Work!



Eric Johnson
Sales, Air Conditioning by Jay, Inc.

SESSION:
You Too Can Sell High Performance HVAC — If You Just Do It!



Vince DiFillipo
President,
DiFillipo's Service Co.

SESSION:
Productive and Profitable Duct Renovations



Kevin Walsh
Owner/President,
Schaafsma Heating & Cooling

SESSION:
Our Leap From Tradesman to Craftsman

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BLOG POSTS

HVAC EQUIPMENT DISASTERS YOU CAN LEARN FROM



Do you ever run into an equipment replacement job you'd rather not think about? Of course you have. In this blog post, David Richardson examines two common disasters and provides some tried and true insights on how to avoid them.

Read it here: ncilink.com/Disasters.

TIPS ON HOW TO UPSIZE A RESIDENTIAL DUCT SYSTEM

When replacing HVAC equipment, better service companies offer duct upsize and system performance upgrades as an option to their customers. These upgrades allow the duct system to perform closer to the level of efficiency claimed by the equipment manufacturer.



Rob Falke explains why you should consider up-sizing a duct system and shares some thoughts on how to explain to customers how it benefits them. Read it here: ncilink.com/Upsize.



Cloud-Based Tools

NCILINK.COM/CMAXX2

The world is hurdling down the track towards doing everything in the Internet Cloud.

ComfortMaxx 4.0 is a cloud-based tool that makes it easy for HVAC technicians to record their performance-based measurements and use them to create consumer-friendly reports that can help sell air upgrades and duct renovations.

It speeds up and simplifies the testing process and helps to hold the technician accountable for the work they do.

ComfortMaxx is available in three levels: Air, Pulse, and Verify. Learn more about it and how it can help your business at ncilink.com/CMAXX2. Or aim your phone at this QR Code.



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2. Collect and input some basic nameplate information.
3. Measure two static pressures and input your readings.

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Bonus: AirMaxx Lite includes links to free videos, tools and articles to help you perform static pressure measurements and diagnose airflow issues today.

Get started on the path to High-Performance HVAC™ today by downloading the app for FREE!

Find AirMaxx Lite in your phone's App Store or Google Play, or scan the QR code below.



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ncilink.com/AML1A



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ncilink.com/AML1D

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Access to the full version of the app is INCLUDED for you.

Search for "AirMaxx" on your phone's app store. Once installed, follow the instructions on how to get your unique access key to unlock the app.

Happy New Year to the HVAC Industry Get Ready for the Fun!



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

As I write this column, the U.S. is on the verge of a historic overhaul of its tax system that, according to some Republicans, will unleash GDP growth of 3 to 4% each quarter. This is based on the proposed cutting of corporate tax rates to 21% which, in theory, will spur investment in new technology, products, and ultimately growth. I hope they are right.

Naysayers trumpet doom and gloom because they believe the tax cuts will add trillions of dollars to the national debt. I hope they are wrong.

The fact is, if this passes, HVAC contracting firms stand to get some much needed relief from their tax burden. That certainly could be a great start to 2018.

Also on a positive note, our friends at Dodge Data and Analytics (<https://www.construction.com/>)

recently released a report that called for 2018 to be a solid year for the overall construction industry. The report predicts that total U.S. construction starts for 2018 will climb 3% to \$765 billion.

Robert Murray, chief economist for Dodge Data & Analytics writes that 2018 “will likely see gains for residential building, up 4%; and nonresidential building, up 2%.”

His predictions are based partially on an overall increase in jobs in the U.S. In fact, a [report issued on December 8, 2017 from the U.S. Bureau of Labor Statistics](#) says the American economy added 228,000 jobs in November 2017, 10 percent of which were added in the construction industry.

For the HVAC Industry this is great news.

In addition, the Dodge report predicts:

- **Single family housing will rise 9%** in dollars, corresponding to a 7% increase in units to 850,000 (Dodge basis).
- **Multifamily housing will retreat 8%** in dollars and 11% in units to 425,000 (Dodge basis).
- **Commercial building will increase 2%**, following a 3% gain in 2017.
- **Institutional building will advance 3%**, maintaining its upward track after 2017's 14% jump.

All of this is to say that 2018 has the makings for a great year by HVAC standards, especially for those in the Performance-based contracting segment. Now why do I say that?

Simple - Performance-Based Contractors have a real leg up because they provide customers -- commercial and residential -- real solutions based on measurement and proof. In other words, the systems they deliver, whether new installations or retrofit/renovations, perform as promised. Customers are willing to pay a premium for that.

According to the U.S. Bureau of Economic Analysis, consumer spending has increased 3.3% in the second quarter of 2017, two thirds of which is on services including housing and healthcare. Today's consumer spending trends point to researching more (thank you Internet) and buying the best for the dollars they spend.

With that in mind, 2018 looks to be a solid year for your business. Now is the time to get inside your customers' homes and do what you do best: improve their comfort, save them energy dollars, and keep them safe.

Now if that isn't fun, then I have no idea what fun is. Happy 2018 everyone! 

NOW IS THE TIME TO GET INSIDE CUSTOMERS' HOMES AND DO WHAT YOU DO BEST: IMPROVE THEIR COMFORT, SAVE THEM ENERGY DOLLARS, AND KEEP THEM SAFE.



2018 AHR Expo Blows Into Chicago this Month

The AHR Expo is one of the HVAC Industry's oldest and largest events. This year the show will be held in Chicago, at McCormick Place from January 22-24th.

Since 1930, the Show has provided a forum for the entire HVACR industry. This includes original equipment manufacturers; engineers; contractors; distributors; commercial, industrial and institutional facility operators; and educators. They come together to discover the latest products, learn about new technologies, and develop mutually beneficial business relationships.

The expo event is co-sponsored by ASHRAE and AHRI. It draws upwards of 65,000 attendees and 2,000 exhibitors. With over 22% of those attendees being contractors, chances are if you haven't attended, you probably know someone who has.

Because there are so many exhibitors, there will be a tremendous number of products on display, making this event one of the best places to discover the latest equipment, systems, and technologies across every facet of the industry.

You will have the opportunity to see live demos and experience products hands-on to understand and compare the different solutions available. Contractors who attend often will get special pricing opportunities only available at the Show.



For the Performance-Based Contracting™ part of the HVAC Industry, National Comfort Institute, Inc. (NCI) and its subsidiary, National Balancing Council (NBC) will be exhibiting. The organization is once again an endorsing sponsor of AHR Expo and can be found in Booth 7478.

It's more than just products! Spokespeople for AHR Expo claim that this year's event is the largest ever educational program in the show's history.

The program features more than 120 sessions including free best practices and industry trends seminars from leading HVACR organizations, professional certification opportunities, and continuing education programs from the ASHRAE Learning Institute.

NCI/NBC is presenting four FREE sessions as part of the Expo's program:

- **Easily Quantify HVAC System Efficiency Loss Caused by Poor Installation** – Monday, January 22nd at 11 AM in Room S102BC.
- **Solve Hidden Maintenance Issues Using Testing and Balancing** – Monday, January 22nd at 1:00 PM in Room S102A.
- **From Estimate to Occupancy; Critical Documentation for Every Test and Balance Project** – Monday, January 22nd at 3:00 PM in Room S102A.
- **Why Residential Air Balance is being Required by Code** – Tuesday, January 23rd at 1:00 PM in Room S102BC.

These FREE sessions require no preregistration. For more detail, go to ncilink.com/AHRClasses

To learn more about the 2018 AHR Exposition, visit their website at <https://ahrexpo.com>.

SEE US AT BOOTH 7478





HYDRONIC DIFFERENTIAL PRESSURE MANOMETER

Dwyer's Series 490A Hydronic Differential Pressure Manometers are available in several basic ranges and can tolerate most liquid media compatible with 316LSS. A new feature added is field-ad-

justable damping, allowing users to choose the level of display averaging rate that corresponds to the fluctuation level common in many applications. The hydronic meter kit includes: two 6-ft. high-pressure rated tubing with shut off valves, high pressure 3-way valve, 8-ft. poly tubing for purges, hard travel case, 1/16" x 1 1/2", 1/8" x 3" and 1/8" x 1-1/2" pairs of pressure probes, 90° Flare to 1/4" NPT fittings, PTFE Tape, and magnetic protective rubber boot. NIST Calibration Certificate comes standard.

For more information or to order, go to ncilink.com/1217Dwyer or call 800-633-7058.

ROTATING VANE ANEMOMETER

The Alnor® RVA801 is a light weight, robust, and simple-to-use rotating vane an-

emometer that provides accurate and reliable readings every time. The RVA801 measures air velocity, air volume, and temperature using simple button operation. It displays readings in metric or imperial mode. It features an attached swivel head that rotates so the display always faces the operator. The RVA801 has a reversible 4-in. (100 mm) head that allows readings at the supply and extract grilles. It calculates volumetric flow rate, provides automatic averaging of air velocity, and requires no density correction factors.

For more information or to order, go to ncilink.com/1217Alnor or call 800-633-7058.



Upcoming NCI Training & Event Schedule

Commercial Air Balancing Certification Program

Jan. 23-25: Houston, TX
 Jan. 23-25: Los Alamitos, CA*
 March 13-15: Kansas City, KS

Introduction to Hydronic Testing, Adjusting, & Balancing

Jan. 30-31: Los Alamitos, CA*
 Feb. 13-14: Cleveland, OH

Combustion Performance & Carbon Monoxide Safety Certification Program

Jan. 9-11: Cleveland, OH
 Feb. 6-8: Austin, TX
 Feb. 13-15: Atlanta, GA
 Feb. 13-15: St. Louis, MO
 Feb. 27-March 1: Richmond, VA
 Feb. 27-March 1: Philadelphia, PA
 March 6-8: Salt Lake City, UT
 March 7: Austin, TX (Post-Conference Recertification)

Commercial System Performance Certification Program

Feb. 20-21: Los Alamitos, CA*
 March 13th-14: Tulare, CA*

Optimize Economizer Performance with Certification

Feb. 22: Los Alamitos, CA
 March 15: Tulare, CA

Duct System Optimization & Air Balancing Certification Program

Jan. 16-18: Los Alamitos, CA*
 Jan. 30- Feb. 1: Lansing, MI
 Feb. 6-8: Tampa, FL
 Feb. 6-8: Las Vegas, NV
 Feb. 20-22: San Antonio, TX
 Feb. 20-22: New Orleans, LA
 March 13-15: Boston, MA
 March 13-15: Des Moines, IA

National Balancing Council Commercial Balancing with Certification

March 19-23: Cleveland, OH

Residential HVAC System Performance & Air Balancing Certification Program

Jan. 23-25: Phoenix, AZ
 Jan. 23-25: Jacksonville, FL
 Jan. 30- Feb. 1: Nashville, TN
 Feb. 6-8: Louisville, KY
 Feb. 6-8: Los Alamitos, CA*
 Feb. 27- March 1: Cincinnati, OH

*Subsidized NCI training offered by Southern California Edison.

If You Don't MEASURE



You're Just Guessing

For nearly two decades the NCI slogan, "If you don't measure you're just guessing," has encouraged the HVAC industry to measure and not guess HVAC system performance. Once you know how to test, calculate, and quantify performance, you realize everyone else in the industry is just guessing as they promise comfort and efficiency. Let's take a look at the difference between measuring HVAC system performance and guessing at it.

Since the focus of our industry shifted in the 1970's from providing comfort to offering efficiency, everyone assumes installed efficiency is equal to the rated efficiency of the equipment. If the yellow sticker decrees 95% AFUE or 20 SEER, the typical HVAC salesperson offers cus-

tomers a 95% or 20 SEER efficient system.

The customer assumes they got what you sold them. That is, until the first scorching hot or freezing cold day arrives, and the new equipment cannot perform as promised. Then the first utility bill arrives, the customer's proof of efficiency, and the guessing game is over – they know they didn't get what they paid for. Everyone up and down the chain loses when this happens.

HVAC SYSTEM PERFORMANCE

HVAC equipment rated efficiency is a number measured in a laboratory under tightly specified conditions. It is a valuable number that is carefully and scientifically documented. It expresses the maximum potential efficiency of the equipment.

However, in no way does this number guarantee or insinuate system efficiency in the field when conditions change. Once installed and connected to up to five other mechanical systems to become part of a heating and cooling system, all bets are off.

Ideally, the moment you install equipment, you should remove the yellow efficiency rating sticker. You should apply a new sticker stating the measured and verified efficiency of the entire installed heating or cooling system.

The typical installed HVAC system's efficiency is 40% to 50% less than the rated equip-





IMAGE: ISTOCKPHOTO.COM

ment efficiency. This is no longer an opinion of NCI, but a well-researched and documented fact. Imagine your re-

sponse to such news about the HVAC system in your home or office?

HVAC SYSTEM EFFICIENCY DEFINED

The [WesternHVACPerformance Alliance](#) defines an efficient heating or cooling system by the amount of heating or cooling measured from the system into the building.

What really matters is the amount of heating or cooling that makes it into the building. If the equipment is rated to deliver 100,000 Btuh of heating and only 50,000 Btuh makes it into the building, the system is operating at only 50% of equipment rated capacity and efficiency.

While this is a new method of viewing HVAC efficiency, it makes perfect

sense to nearly every consumer considering buying, replacing, or upgrading their HVAC system. This is the primary reason an NCI professional has such an advantage over competitors.

This definition of system efficiency totally eclipses the old rating methods, because it measures the efficiency deterioration imposed on the equipment by its installation into a building. Appropriately, measure, calculate, and publish a new installed system efficiency. That way, all parties influenced by the job know for sure and the efficiency guessing game is over.

IS THE NCI SLOGAN MAKING MORE SENSE NOW?

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adjust systems to perform the closest to equipment rated efficiency. Once their systems are installed, they measure and publish this new efficiency score to document installed system performance. Meanwhile, others only guess, imply, assume, and insinuate the efficiency of their systems. Who do you think will win this race to the top?

With this new definition of heat-

RARELY, IF EVER, DOES POTENTIAL EQUIPMENT EFFICIENCY EQUAL THE INSTALLED SYSTEM EFFICIENCY.

ing and cooling system efficiency in mind, go online and study the manufacturers' and other contractors' websites. Notice their claims of comfort and efficiency assume equipment rated efficiency equals the installed efficiency of the HVAC system. You will see most are guessing.

HOW TO MEASURE SYSTEM PERFORMANCE

NCI has developed, taught, and supported a test method to score HVAC system performance since 2001. NCI's basic HVAC system scoring method is being shared with the industry through the development of a proposed ASHRAE standard that should be available for public review soon.

The basic test and calculation scor-

ing method takes less than an hour to complete on most systems. Training, certification, test instruments, and software are available to support this measurement and scoring method. Here are the basic steps to determine the score of an installed residential or basic commercial HVAC system.

1. Gather the equipment nameplate information and specifications. From this data, determine the equipment's rated heating or cooling capacity under current operating conditions.

2. Measure system airflow into the building. Do this by measuring airflow at each supply register. Then add each of the readings together.

3. Measure and average the air

The banner features a night-time aerial view of the Chicago skyline. In the top left, the National Balancing Council logo is displayed. To its right is the NCI logo, which includes the text 'NCI' in a large, bold font and 'National Comfort Institute, Inc.' in a smaller font below it. Below these logos, the text 'VISIT US AT BOOTH 7478' is written in a large, white, sans-serif font. On the right side of the banner, there is a large, stylized logo consisting of five curved, overlapping shapes in shades of blue and orange, resembling a flower or a fan. Below this logo, the text 'AHR EXPO' is written in a large, white, sans-serif font. At the bottom of the banner, the text 'CHICAGO' and 'JAN 22-24' is written in a large, white, sans-serif font.

THIS DEFINITION OF SYSTEM EFFICIENCY TOTALLY ECLIPSES THE OLD RATING METHODS, **BECAUSE IT MEASURES THE EFFICIENCY DETERIORATION IMPOSED ON THE EQUIPMENT BY ITS INSTALLATION INTO A BUILDING.**

temperature leaving each supply register and entering each return grille.

4. Calculate the amount of heating or cooling entering the building. To do this, multiply the airflow (cfm) entering the building by the average air temperature difference between the supply registers and return grilles by the appropriate Btu multiplier.

The answer is the heating or cooling Btu entering the building from the system.

5. To score system performance,

divide delivered Btu of the system by the rated Btu of the equipment.

IF YOU DON'T MEASURE, YOU'RE JUST GUESSING

This number is published as the system's installed performance score. What score would your installed systems earn? This score can be measured before and after you make improvements to the system to document the increase in system efficiency. What would a 40% increase in efficiency be worth?

If you do measure, you can know

for sure and use this new-found information to improve the performance of the HVAC systems you design, sell, build, and maintain.

We invite you to learn about and apply the principles of HVAC system measurement. You will then begin to discover system defects you overlooked throughout your career. You'll also begin to see the possibilities of significantly improved system efficiency, comfort, and performance in your career. 



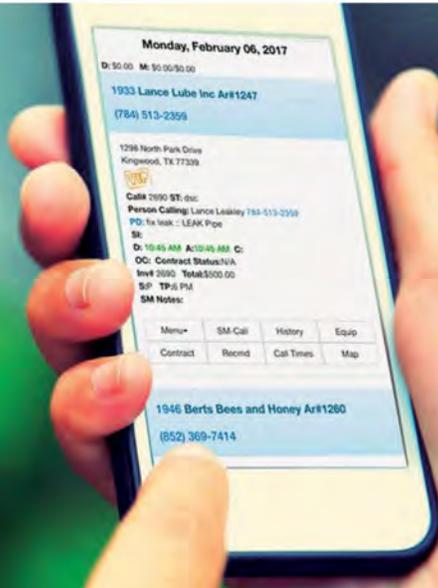
Rob Falke is the president of National Comfort Institute, Inc.

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Stranded HVAC Performance Potential

Most consumers have minimal awareness and understanding of their heating, ventilation, and air conditioning (HVAC) systems. They typically regard the HVAC system as a simple appliance that is only noticed under the following situations:

- When it operates noisily
- It fails to deliver comfort
- If they see an upward deviation in their utility bill.

The fact is, most HVAC systems -- whether noticed or unnoticed -- are not

achieving the manufacturers' designed performance specifications. This performance variance goes undetected when temperatures are moderate and maximum cooling or heating is not in demand.

When an HVAC system operates during these periods in a degraded state, consumers have no idea it is running at a lower efficiency. They also don't know they are not receiving the full capacity and efficiency of their systems. Unfortunately, many only realize something is wrong only when they:

- Receive an abnormally high utility bill
- Experience discomfort during the hottest or coldest parts of the year
- Are forced to make an emergency repair call for a premature component failure.

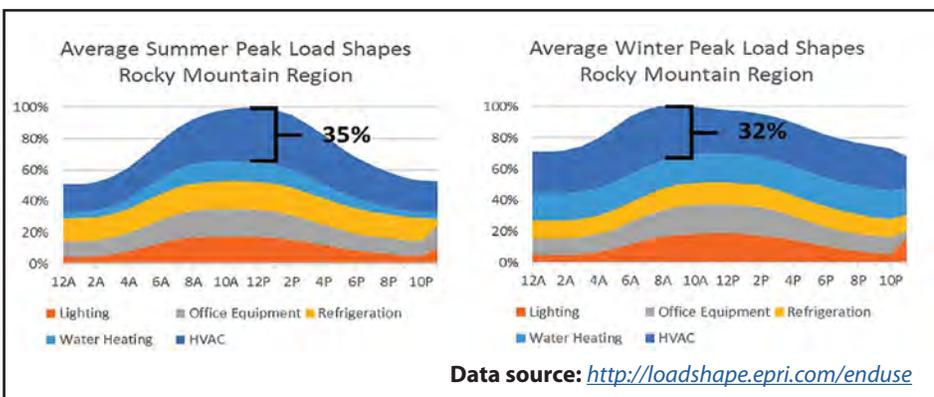
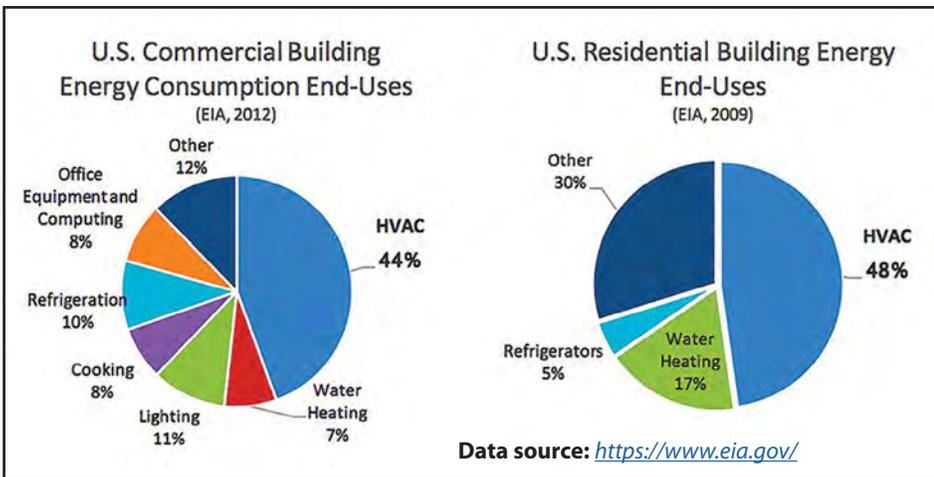
Most consumers want to get the most out of their systems for the least amount of cost.

A MULTI-SIDED ISSUE

HVAC system performance is not perceivable without measurement. Measurement allows a qualified contractor to better communicate to consumers with fact-based information about their system. This educates and equips them to make informed purchase decisions. Most consumers value this approach as it provides an opportunity to solve concerns with safety, comfort, and efficiency.

The reality, however, is that most HVAC contractors do not take an approach based on system performance measurement and improvement. Instead, they try to sell new equipment and service agreements. Or they only apply temporary fixes to help the system limp along until the next inevitable emergency call.

Opportunities to address underlying issues, for those contractors not performance-based, typically arise only when a consumer faces a system failure. That is when they must make a decision between repairing, replacing, or upgrading the equipment and system. Many utility programs rely primarily



on this opportunity to offer high efficiency equipment replacements.

This replace-on-burnout (ROB) model limits the utility's and customer's success. It heavily relies on distributors having high-efficiency equipment in stock and consumers typically being unwilling to spend the extra money to address hidden issues in the duct system. This leads to the same performance degradation on the new equipment that caused premature failure of the old equipment. So, the cycle continues.

HVAC SYSTEMS REPRESENT THE HIGHEST END-USE COST

Consumers are not being informed about the impact of degraded performance on their comfort and energy costs. Degraded performance is a symptom of hidden issues that cause uncomfortable conditions, poor indoor air quality, and low efficiency. These hidden issues also result in unexpected system breakdowns and shortened equipment life.

According to the U.S. Energy Information Administration, HVAC accounts for 44% of commercial building energy consumption, and 48 percent of residential energy consumption. More detailed regional load shape analysis shows that HVAC also comprises the largest component of both summer and winter peak demand, with its' contribution typically exceeding one third of a building's peak load.

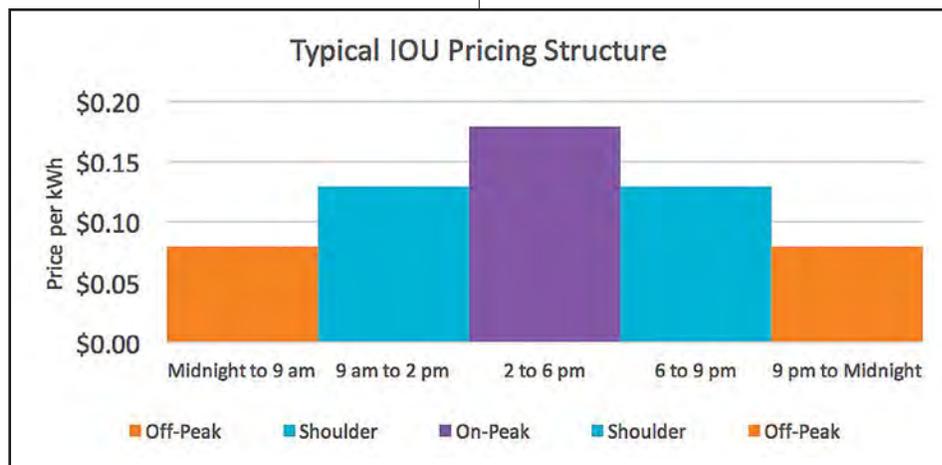
What these metrics mean for customers is that HVAC is their number-one energy cost, particularly during times of year when they have the highest utility bills. Utilities have a vested interest in flattening load shapes to avoid building new power plants and increase as-

set use for existing plants.

Smart meters allow utilities to send a pricing signal to attempt to get customers to reduce their electric usage during times of high demand. Strategies include peak demand charges, time-of-use pricing, and critical peak-period pricing. These strategies all attempt to match the pricing structure to the load shape,

hottest and coldest parts of the year. The good news is that performance can be improved significantly. Renovation work on the same 155 systems increased system delivered capacity to 83%, an improvement of 93%!

By measuring performance on these 155 existing systems, contractors were able to show customers why their sys-



charging more money during times when the most energy is being used.

Each of these strategies share a common shortcoming. Customers cannot curb their demand if they don't understand what is causing high energy use during peak periods.

MEASURED HVAC SYSTEM PERFORMANCE

To identify what causes high HVAC energy use, NCI captured and recorded field performance data for a sample of 155 commercial and residential HVAC systems around the country. This work revealed that the average system only delivers 43 percent of the equipment's rated capacity to the occupied space.

HVAC systems performing this poorly result in extended equipment run time, increased energy use, and uncomfortable buildings, especially during the

tems were not performing well and costing more than they should. For the first time, contractors were equipped to provide customers renovation work targeted at system improvement. They then verified the success of that work using the same measurement methodology they started with.

This end-to-end performance-based approach gives customers confidence that they are making the right decisions throughout the entire process, and seeing immediate reductions in their utility bills and improvements in comfort.

NCI INTERVENES IN CALIFORNIA'S HVAC STRATEGIES

On Sept. 18, 2008, the California Public Utilities Commission (CPUC) adopted California's first Long-Term Energy Efficiency Strategic Plan which included "Big Bold Goals" for HVAC¹.

These goals were then taken one step further via an HVAC Action Plan to serve as a road map to transform the market.

As a result, California Investor Owned Utilities (IOUs) were required to adopt the HVAC Action plan and Strategic Plan strategies. They had to take steps to incorporate stakeholder input into their energy efficiency program planning and implementation statewide.

In late 2010, the HVAC Industry was invited by the California Investor Owned Utilities (IOU's) to provide professional services in support of an HVAC Action Plan and Strategic Plan strategies. They were asked to provide a focused performance-based HVAC workforce education and training (WE&T) effort under

National Comfort Institute, Inc. Sample of Typical Results 155 System Improvements		
Median Values	Equipment Delivered % of Rated Btu/h	System Delivered % of Rated Btu/h
Test In	69%	43%
Test Out	93%	83%
% Improvement	35%	93%

the umbrella of the 2009-2017 Residential & Commercial HVAC Programs.

A year later, additional professional services expanded the industry focus on promotion, delivery, measurement, and verification of maintenance and installations performed by HVAC contractors. The work included a performance-based renovation pilot program, which culminated in a field data collection effort that demonstrated significant energy savings for each system renovated.

Perhaps more importantly, it provided a strong correlation between measured performance improvement and savings at the meter.

SHARING KNOWLEDGE WITHIN THE INDUSTRY

As our industry shares these concepts with broader audiences and collaborates with utilities, regulators, and state government, we can better quantify and improve installed HVAC system performance. As a result of the

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HVAC Industry's involvement, NCI began the process of developing ASHRAE 221P, a Test Method to Field-Measure and Score the Performance of an Installed Unitary HVAC System.

We want to share a key piece of what we learned so the industry can offer a higher standard of quality. Currently the standard development process is well underway, with publication expected sometime in the first half of 2018. ASHRAE 221P details the procedures, calculations, and instrumentation required to measure system capacity and efficiency in the field.

IF YOU DON'T MEASURE, YOU'RE JUST GUESSING!

Over the past two decades NCI has trained and certified more than

25,000 HVAC Industry professionals in Performance-Based Contracting™. They have also provided professional services to one of the nation's largest electric utilities. Because of those experiences, the greatest opportunity for reducing peak demand and energy use is to target the installed base of inefficient HVAC systems. This is done by addressing performance degradation and equipping installing contractors to sell and install Performance-Based HVAC systems. As a result, consumers will become more informed about their HVAC systems and better understand how performance affects their comfort and operating cost.

Consumers who know what they need to do will expect contractors to provide services that prevent perfor-

mance degradation. These consumers value maintenance that sustains overall system capacity and efficiency.



¹ The final CLTEESP was released on August 20, 2008. California's Long Term Energy Efficiency Strategic Plan – September 2008 - Original version of the Strategic Plan adopted in D.08-09-040 and is available at

• <http://ncilink.com/DLAsset5305>

• <http://ncilink.com/Decision>



Mel Johnson, Vice President for Utility Programs for NCI, is responsible for identifying and executing business development strategies and partnership building industry partnerships.

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You **CAN** Sell High Performance HVAC Systems if You Just **“Do It”**

You really can sell High Performance HVAC Systems if you first commit to doing it, and then take things one step at a time.

“It” is an interesting word. The dictionary definition includes: a crucial or climactic point; that one; an explicit or implicit state-of-affairs or circumstances; exactly what is needed or desired; a goal to be achieved.

I’m amazed that such a simple two letter word baffles, stumps, and even paralyzes many individuals.

The sports giant Nike first employed the “just do it” phrase in 1988 as the cornerstone of a new ad campaign, propelling the brand’s North American market share from 18% to 43% by 1998. While the campaign never defined what “it” is, the slogan, combined with visuals of hard work and determination, motivated many people to get off the couch and pursue higher levels of physical performance in a variety of recreational and competitive venues.

Why are we so afraid to just do it? Could it be that we like where we are? Is the fear of the unknown keeping us from achieving better results? Is hard work too big a price for the results we desire?

THE ONLY WAY TO DO PERFORMANCE-BASED CONTRACTING IS WITH ABSOLUTE INTEGRITY. YOU MUST SAY WHAT YOU WILL DO AND DO WHAT YOU SAY.

Most people do not realize that by just doing it, “it” will literally improve every aspect of our lives. If everyone committed to this mindset with full devotion, failure would be absolutely impossible.

I challenge you to adopt this potent mantra into your minds, hearts, spirit, and every fiber of your being. Do it, and you will succeed.

WHAT “IT” IS

With Performance-Based Contracting™, there are no immediate promises of rewards up front. Notice I said no immediate promises or rewards. I’ll guarantee you this though - by the time you’re in second or third gear, cruise control is not far away. It’s going to require some work, adjusted plans, more sweat, and purposeful thinking. Once you commit to just doing it, it’s the coolest, sexiest, most fulfilling feeling in the entire universe.

Here’s a tip. The only way to do performance-based contracting is with absolute integrity. You must say what you will do and do what you say. Guess what folks? You can’t spell the word integrity without “it.”

I believe that most HVAC contractors lack a clear understanding of what the “it” is that transforms their ordinary equipment replacement jobs into high-performance HVAC systems. This lack of clarity is the difference between an unprofitable business and one that is very profitable, that stands out in the crowd as the best.

For our company, AC by Jay, the “it” is consistently delivering service that results in happy customers who willingly pay a premium price for a premium product and gleefully refer us to all their family and friends. Long story short, we’re committed to shattering our customer’s expectations.

SATISFACTION IS NO LONGER THE STANDARD

We must comprehend that satisfaction is no longer the standard! Let me give you an example. Let’s talk about garbage collection. Trash collection day in my neighborhood is every Monday. I am 100% satisfied with the company that collects my trash. I don’t know the driver’s names, ages, ethnicity, favorite sports teams, or any of that stuff. I don’t even know what the sign on the side of

Meet Eric Johnson at NCI Summit 2018

High Performance HVAC Summit 2018 is happening March 4-6 in Austin, TX. Eric Johnson is one of six Performance-Based Contractors™ presenting how they Blaze A Trail to High Performance. Johnson sells approximately \$2 million annually in residential replacement and renovations for AC by Jay in Scottsdale, AZ. He considers himself a “pro-person” salesman and will share how his company approaches selling Performance-Based Contracting™. His presentation, **You Too Can Sell High Performance HVAC – If You Just Do It!** walks you through overcoming the inertia of getting started. He explains how his adaptation of the Nike slogan helps him really set AC by Jay apart in their marketplace.

Come meet Eric and network with your peers in Austin. Learn more about the Summit 2018 program at GoToSummit.com.

JOIN US FOR SUMMIT, STAY FOR SOUTH-BY-SOUTHWEST MUSIC FEST: Summit 2018 offers you and your team the opportunity to not only hear from some of the Performance-Based HVAC Industry’s finest, but also a chance to network with like-minded contractors from across the nation.

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EARLY BIRD ENDS ON JANUARY 15th. Don’t hesitate. You can still save hundreds on your registration costs.

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After Summit ends, stick around for our Post Show Training classes and then head into downtown Austin for one of the world’s best music festivals, [South by Southwest](#). [Click here for details.](#)



dent, premium, and pristine performance in waste disposal. This company would be the personification of “Just Do It” service!

There would be no limit to the amount of trash you could leave at your curb. Imagine the trash collector not leaving one piece of trash behind. The driver would get out of the truck at every call and empty your garbage. He would then quickly pressure wash your garbage can, and the surrounding area. He would wheel your trash can up your driveway and park it

where you desire.

Sounds like a lot, huh? But, how many of us would prefer this type of experience versus the one I previously described. There’s a reason I chose to use garbage to make my point. Garbage is what we throw away! So, if we all admit that we’d value a more hygienic and professional way of dealing with the crap we throw out, what type of experience do we owe our customers who entrust us with their family’s safety, health, comfort, and energy efficiency needs?

A trash collection company couldn’t be successful delivering expectation-shattering “just do it” service if only one employee believed in “IT.” **THE ENTIRE TEAM MUST BE ON BOARD!** I look forward to sharing more on how we do it at AC by Jay during the upcoming Summit Conference in Austin, Texas!

See you there (If you “just do it”, that is)! 



Eric Johnson sells residential replacement and renovation for Scottsdale-based HVAC contractor AC by Jay. Since 2012 he has consistently sold over \$2 million annually.

the truck reads. But I’m satisfied. And why wouldn’t I be? I assume the driver is doing exactly what he or she is being paid to do. Right?

Now here’s the thing. Why is it that I’ve never run out to the garbage truck and professed my undying, unwavering love and appreciation to the driver or the company? Well, maybe it has something to do with the time that my trash receptacle was a little too full.

So, I come home at the end of my work day. The trash truck has clearly come by and emptied my trash can. I love the technology they’ve embraced. They use a very impressive mechanical Transformer-like, death grip Terminator extension arm. But, here is the million-dollar question: since the trash collector has clearly emptied my can, why is my son’s dirty diaper, a half empty

expired bottle of Pepto Bismol, and last night’s spaghetti and clam sauce spread all along the curb in front of my house?

It’s because the driver did exactly what he was paid to do. He did just enough to get his paycheck. He used his robo-claw to pick up my trash can and empty it into his truck. Heaven forbid he clean up the mess he left behind.

Typically, my garbage can isn’t too full and there is no trash left on the ground. Even though they successfully transferred my garbage to their truck, I’m still left with an empty, nasty, smelly can. Ladies and gentlemen, we actually pay for that type of mediocre service every month!

SHATTERING EXPECTATIONS

Now imagine this... What if there was a company that delivered pru-

3 Ways to Solve Return Duct Obstacles



Figure 1: Enlarge the Return Drop.

One consistent obstacle we face at DiFilippo's Service Company is two-story homes built above short basements. Many were originally designed for heating, not cooling. We also encounter short basements where larger, more efficient equipment is converted to fit into tight, finished spaces. And to top things off, many houses have upper floors where we cannot add ductwork. These situations present challenges that require creativity to resolve.

There will be times when a house beats you and you can't do much. In those cases, we don't give up because you can make significant improvements at or near the equipment. In our market place, we run into a lot of issues associated with return ducts, or lack of them. In this article, I'll focus on three ways DiFilippo's solves return obstacles in basements.

ENLARGE THE RETURN DROP

The number one return upgrade we perform is to increase the return drop size. Most return drops we encounter are drastically undersized. When we enlarge these ducts, we also add turning vanes to the elbows to allow for smooth airflow.

WHEN A HOUSE "BEATS" YOU, DON'T GIVE UP. YOU CAN STILL MAKE SIGNIFICANT IMPROVEMENTS AT OR NEAR THE EQUIPMENT.

There are many systems in our area with five-ton blowers and one return drop. The equipment can't function properly and is often choked at the inlet. Typically, these systems run at very high total exter-



Figure 2: Second Example of Enlarging the Return Drop.

nal static pressures (TESP) and low fan airflow. Following are some typical examples we've encountered and what we did to fix them.

In **Figure 1**, note that this five-ton system was originally installed with a single return drop in one side. The TESP was excessive and fan airflow was low. Our team added a second properly-sized return drop and filter to reduce static pressure and increase airflow. We were lucky to have the room to add that second return drop and additional return ducts. Some basements aren't that open and options are limited.

In **Figure 2**, we encountered a home that limited the options we could offer. The five-ton system was installed with a single return drop tied into the right side of the furnace. To correct the static pressure and airflow issues, we lifted the furnace and brought in a properly-sized return drop to its side and bottom.

INCREASE RETURN TRUNK DUCT SIZE

The second most common return upgrade we perform is increasing the



Figure 3: Increase Return Duct Size - Before.

size of the return trunk to the equipment. Having a properly-sized return drop is useless if return air can't make it back from the return grilles to the equipment.

On the system depicted in **Figure 3**, there was no chance for return air to make it back to the equipment. We had no choice but to completely redo the return trunk with one that could handle the right amount of airflow.

Depending on the style of the house, a complete redo of the return trunk might not be needed. In some instances, we only need to replace a few sections of duct.

To maintain headroom, **Figure 4** shows how we made the return trunk wider so it would not fall below the beam. Airflow through the return grilles increased and return duct pressure dropped substantially once this upgrade was finished.

ADD RETURN DUCTS

There will be times when even a properly-sized return drop and trunk won't deliver needed air. In those cas-

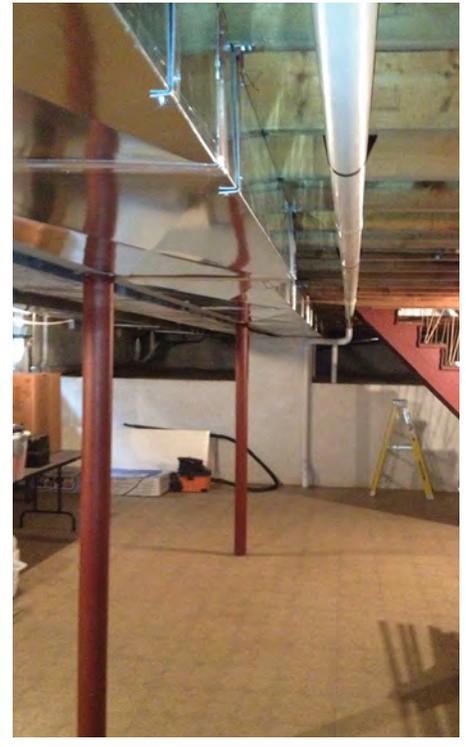


Figure 4: Increase Return Duct Size - After.

es, we look for alternative ways to get additional return to the system. Some house layouts are easy to add a floor return in an open area, others require more creativity:

In the system shown in **Figure 5**, we encountered tight access and had to add a return grille to the toe kick of the stairs. The homeowner's den had no return and couldn't recirculate air from the room as needed.

If you add a return duct, be sure air isn't pulled from an area with natural draft gas-fired equipment in it. You could create a dangerous situation and a potential for CO poisoning.

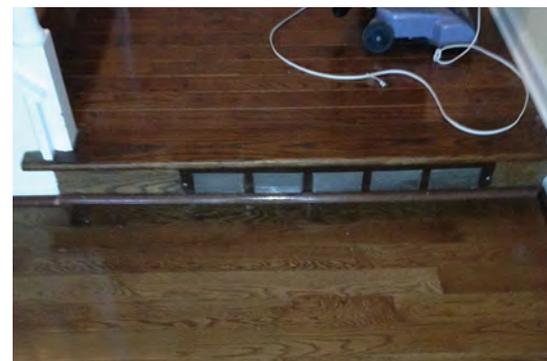


Figure 5: Step Down Return Grille.

DON'T FORGET

While this is a look at one of the most common things we see, don't forget the supply side of the system. We see a lot of supply problems and repairs are often necessary on the air delivery system and not the equipment. Be sure to look at the entire system.

How do you handle these challenges and guarantee a customer's comfort? We'd love to hear some of your creative solutions. Please drop us a note at ContactUs@HVACToday.com. 



Vince DiFilippo is the president of DiFilippo's Service Co., an HVAC contracting firm headquartered in Paoli, PA.

Meet Vince DiFilippo at NCI Summit 2018

High Performance HVAC Summit 2018 is happening March 4-6 in Austin, TX. Vince DiFilippo is one of six Performance-Based Contractors™ presenting how they Blaze A Trail to High Performance. DiFilippo, who is president of DiFilippo's Service Company in Paoli, PA, will share how his company makes money doing **Productive and Profitable Duct Renovations**. He will walk you through several case studies and guide you through where to start, how to identify what you may need, and why your perception about how to solve airflow issues might need to change.

Come meet Vince and network with your peers in Austin. Learn more about the Summit 2018 program at GoToSummit.com.



JOIN US FOR SUMMIT, STAY FOR SOUTH-BY-SOUTHWEST MUSIC FEST: Summit 2018 offers you and your team the opportunity to not only hear from some of the Performance-Based HVAC Industry's finest, but also a chance to network with like-minded contractors from across the nation.

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| Feb. 20-22: San Antonio, TX | March 27-29: Columbus, OH |



For more information, go to ncilink.com/0118DSO or call 800.633.7058



2017 HVAC Photo of the Year

National Comfort Institute, Inc. and *High Performance HVAC Today* magazine are pleased to announce the 2017 HVAC Photo of the Year! The grand prize image was selected from the nine monthly winners as voted on by the visitors to the HVACToday.com website throughout 2017.

Besides being featured on HVACToday.com (the digital edition and the website), and on PerformanceTalk, **the Photo of the Year Winner receives the Grand Prize -- a free registration to National Comfort Institute's High Performance Summit** (Up to \$795 in value), in Austin, TX, March 4-6, 2018.

THE FIRST ANNUAL WINNER IS:

Ryan Smith, Benchmark Air Conditioning, Bakersfield, CA.

Ryan's entry appeared in the July 2017 issue of the High Performance HVAC Newsletter and was titled, "But They Were Cheaper."

Congratulations, Ryan! See you in Austin in March.

**Airfare and hotel are NOT covered by this award. Coverage is for Full registration to Summit only.*

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Register Now for NCI's High Performance Summit 2018

Blaze your trail to high performance in Texas at the 2018 High Performance Summit. This action-packed event will be here before you know it. Join us in Austin, March 4-6, 2018 and learn from your fellow contractors how they are making Performance-Based Contracting™ work in their businesses.

Early Bird Savings Plus A BONUS: You can still save \$100 in Early Bird Savings off each full Summit registration, but those savings end on January 15th.

Furthermore, as a National Comfort Institute member you'll earn 5% NCI bucks and members with the Learning Excellence subscription earn 15% NCI Bucks for all Summit Week events.

Just point your web browser to [Go ToSummit.com](http://GoToSummit.com) to learn more and register. Or call 800-633-7058.

Who Are This Year's Speakers? This year, every session is being led by Performance-Based

Contractors. All of these contractors are in different stages of making Performance-Based Contracting part of their culture and daily approach to customers.

It doesn't matter if you are just starting out on your Trail to Performance, or are well into

it. These leaders will share their stories, and provide tools that will help inspire and fire you up.

Go to the [Summit website](#) to read about who they are.

But Wait: There is More! Looking for more detail on what the Summit topics are all about? Visit NCI's new magazine website, [High Performance HVAC Today](#), and check out the articles from

the December 2017 issue by two of our speakers:

- **Kevin Walsh** of Schaafsma: [From Tradesman to Craftsman: How Our Company Made the Leap](#)

- **Tom Johnson** of TM Johnson Brothers: [My Journey to Becoming the Local CO Evangelist](#).

Walsh provides insight into his think-

come to Summit for the education and networking, and stay for South by Southwest and the music.

DID YOU KNOW?

Did you know that as a National Comfort Institute, Inc. member you can earn even more NCI Bucks through the Training Incentive Partner Program (or TIPP

COME TO THE NCI HIGH PERFORMANCE HVAC SUMMIT FOR THE EDUCATION AND NETWORKING, THEN STAY FOR THE SOUTH BY SOUTHWEST FESTIVAL AND THE MUSIC.

ing as to why Performance-Based Contracting was good for his company, and then shares his experience in making it happen.

Johnson talks about the influence of proper training in the art of combustion analysis and how that led his team to actually become experts in finding and solving core combustion issues that could lead to carbon monoxide (CO) poisoning.

Still More to Come.

We will be publishing additional articles by the speakers on their Summit topics in the very near future. In fact, the January 2018 issue of the magazine will feature articles by speakers Eric Johnson, AC by Jay, on selling high performance, as well as one by Vince DiFilippo, DiFilippo's Service, on solving duct obstacles.

And Even More. This year's Summit happens directly before the famous [South by Southwest](#) music festival. So,

for short). TIPP allows you to earn incentives based on your purchases of equipment, products, and service from our vendor partners that can be used to help pay for your NCI training.

All existing NCI members are eligible to participate in TIPP. If you choose to do so, an individual training account is set up for you and our industry partners will begin depositing NCI Bucks into it based on your purchases. These bucks can be used to pay for any live NCI training class, any online training, as well as any NCI conference.

This is a tremendous benefit. NCI training bucks never expire. They carry over from year to year with no penalties or loss in value. Furthermore, they are not taxable, so you save money over traditional rebate programs.

Learn more about all of the TIPP features and benefits by [clicking here](#). And if you haven't done so, sign up for it today. Just call Nick Guarino at 800/633-7058 or email him today at nickg@nci-hvac.com and he will help to get you all set up.





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10 Reasons To Attend Summit 2018



Dominick Guarino is publisher of HVAC Today magazine and CEO of National Comfort Institute, Inc. He can be reached at domg@ncihvac.com

March is quickly approaching, and NCI's 2018 Summit is right around the corner. Whether you're an NCI member or not, this year's Summit is one you won't want to miss.

The 2018 conference is all about getting together with your fellow high-performance contractors, learning from each other's successes and failures, and creating your game plan for 2018.

Performance-Based Contracting is without a doubt the next Blue Ocean for the HVAC industry. If you have not yet read the book, *Blue Ocean Strategy*, by W Chan Kim and Renee Mauborgne, I recommend you pick up a copy.

This year Summit is limited to 300 attendees. Will you be one of the 300 who will use this opportunity to blaze their trail to high performance? Or will you wait until the last minute, and miss an event that could make a huge difference in your business and bottom line in 2018 and beyond?

While there are many more, here are 10 great reasons to join us in Austin this March 4-6:

1. Summit has something for everyone. Wherever you are on the path to performance

business, away from distractions, away from the hustle and bustle of working **in** your business.

4. Take in all six workshops led by your peers who are implementing Air Upgrades and more. Breakout sessions are structured so you can attend every workshop and not miss a thing.

5. Attend our three-part Idea Meeting where you can share and get great implementation ideas in three categories from hundreds of your peers. You'll also have a chance to win a cash prize if your idea is voted one of the best.

6. Spend quality time with NCI's industry partners in our intimate trade show. Learn about their products and services. Discuss how they can help support your performance-based business.

7. Network with your fellow contractors during formal events and afterwards. Wherever you are along your journey, take advantage of this neutral ground where you can share your hopes, dreams, and plans with contractors just like you.

8. Take the opportunity to assess your progress as you implement High Performance in your company. Put together an action plan to hit the ground running when you get back home.

9. Attend the Awards Banquet and help us recognize and celebrate this year's winners. Meet some of the best of the best at these closing festivities. Who knows? You may be nominated for an award yourself!

10. Stay for South-By-Southwest (SXSW), one of the country's premier arts conference, music, comedy, and film festival starting March 9, following our post-conference training.

With so many great reasons to make Summit 2018 your destination this March, don't wait until it's too late! Register today for this epic event. Have a fantastic 2018! 



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you'll be inspired to action. You'll take home great new knowledge and implementation strategies.

2. Learn how to market your performance-based services. Hit the ground running this spring with new ideas on how you can market your capabilities, and generate leads from high-performance testing on every service call.

3. Use Summit as a retreat to work **on** your

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NCI-Led Sessions:

Easily Quantify HVAC System Efficiency Loss Caused by Poor Installation

It's common knowledge that a poor installation will seriously deteriorate the performance of an HVAC system. The question is how much? This session will address a test method that quantifies the amount of efficiency loss. It will also pinpoint the system deficiencies so repairs can be made to restore performance.

Led by Ben Lipscomb, PE, and Rob "Doc" Falke, 11 AM - 12:30 PM, Room S102BC

Solve Hidden Maintenance Issues Using Testing and Balancing

Service managers, manufacturers and facility personnel claim up to 70% of the long-term service and maintenance issues can be identified and resolved through testing and balancing principles. Learn to discover these hidden defects in your systems by using straightforward field testing and diagnostics reviews in this session.

Led by Mel Johnson and Rob "Doc" Falke, 1 PM - 2:30 PM, Room S102A

From Estimate to Occupancy; Critical Documentation for Test and Balance Projects

Beyond balancing, fifty percent of the TAB professionals job is documentation. From company submittals and proposals to deficiency notices and close-out documentation. Learn best practices and professional requirements during every stage of documenting the TAB process.

Led by Scott Fielder, 3 PM - 4 PM, Room S102A

Why Residential Air Balance is Being Required By Code

Air balancing was once reserved only for commercial HVAC projects. However, many new building codes are requiring residential balancing. Investigate the benefits hoped for by this new movement and learn the reasons to specify and include balancing in your residential projects. Balancing verifies if the intent of system design has or hasn't been met.

Led by Rob "Doc" Falke, 1 PM - 2:30 PM. Room S102BC

Visit AHREXPO.com to Register



NCI High Performance HVAC Summit 2018

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