

HIGH-PERFORMANCE HVAC TODAY™

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

Local Heroes in A Time of Crisis

*Vincent's Heating and Plumbing,
Port Huron, MI*



ALSO IN THIS ISSUE:

Why You Should Design HVAC Systems Using Manual J Load Calculations

How Using ComfortMaxx™ Enhances Performance-Based Contracting™

Contractor Spotlight: DiMarco & Associates

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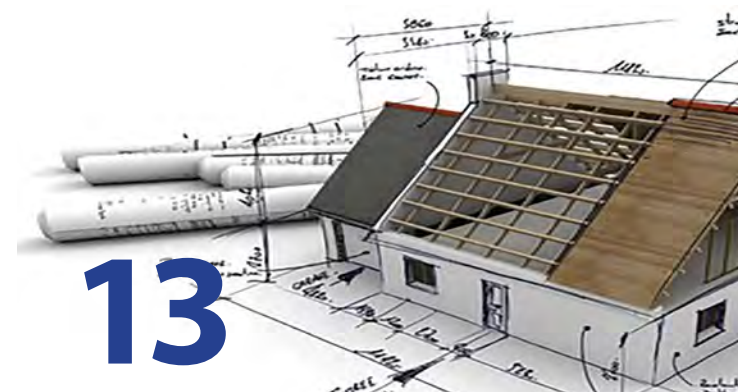
HIGH-PERFORMANCE HVAC TODAY™



COVER STORY:

Turn to Helping During Times of Crisis

Community is more important than ever. See how Vincent's Plumbing and Heating is helping their neighbors.

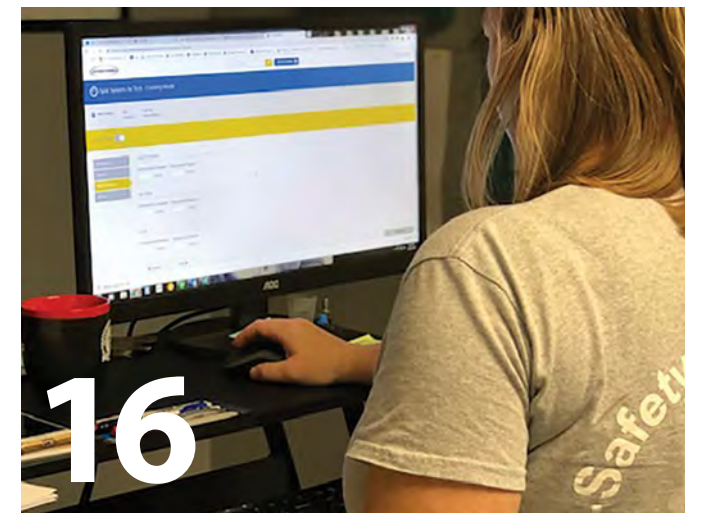


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TECHNICAL:

Design HVAC Systems Using Manual J Calculations

Rules-of-Thumb are ridiculous. Contractors must design systems using Manual J. Author Paul Wieboldt explains.



MANAGEMENT:

How ComfortMaxx™ Enhances Performance-Based Contracting™

This cloud-based software helps contractors like GV's Heating and Cooling improve their High-Performance Contracting approach to service delivery.

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A Call for Entries: High-Performance HVAC Project Awards



Mike Weil is editor-in-chief and director of communications and publications at National Comfort Institute, Inc. Reach out to him at MikeW@ncihvac.com

Selling, designing, and installing High-Performance HVAC systems is a science and an art form. In today's marketplace, the vast majority of HVAC contractors are so busy plying their trade by focusing on the work, getting the job, and on keeping busy, they often lose sight of the technical skill, the science, and the artistry behind what they do for a living. That creates a scenario where what they do becomes commoditized and price-driven. And that does nothing to ensure customers get what they pay for — comfort, energy efficiency, as well as a safe and healthy indoor environment.

Let's face it — since the pioneering days of this country, hard-working people in the building industry have spent years perfecting their trade. In fact, they were often held in such high regard as to be called craftsmen and artists and the sign of their success was seen in the pride of ownership exhibited by their satisfied customers. We want to shine a light on a small, but growing force within the HVAC Industry that is striving

for excellence through measurement, data analysis, and testing to deliver the very best quality this industry has to offer.

With that in mind, in February, National Comfort Institute announced their High-Performance HVAC Project Award competition. In a nutshell, this contest provides an opportunity for contractors to show off their best designs to the rest of the industry. It allows them to demonstrate how Performance-Based Contracting™ not only far exceeds traditional approaches to the trade but highlights how they can make more money doing it.

This new award recognizes Performance-Based Contracting™ firms that apply their NCI training to properly test, measure, diagnose, and resolve residential customer comfort and efficiency issues.


I explained the key points of what the High-Performance Project Award is all about in my February 2020 *Today's Word* editorial in this magazine. If you missed that, just click here for more details: ncilink.com/0220TodaysWord.

There will be only one winning entry as determined by a panel of NCI judges. Second and third runners up will also be recognized.

Awards will be presented during the High-Performance HVAC Summit each year, plus the winning project will be written up in the **High-Performance HVAC Today** magazine.

We've extended the submission deadline to June 1st, 2020: Go to ncilink.com/awardsubmission to enter your project today. The form may take some time to complete, but no worries: it will remember where you are so you can close out and pick it back up.

If you have any questions, please feel free to drop me a note at MikeW@ncihvac.com.

We look forward to seeing your entries. Good luck! 



Written By HVAC Professionals for HVAC Professionals



IQAir- Air Visual Pro

Have you been looking for a way to initiate discussions with customers about indoor air quality? Do you wonder if there are better ways to demonstrate the additional benefits of duct renovations to customers? The **IQAir Indoor Air Quality** monitor can be an added tool for use in educating customers on how their HVAC system affects the air they breathe.

The Air Visual Pro monitors and displays readings of temperature, relative

humidity, particle count at PM2.5, and CO₂ (Carbon Monoxide) in ppm on its large color screen. The screen displays both current measurements as well as a bar graph of hourly measurements over 24 hours.

This monitor has a built-in rechargeable battery, however battery life is relatively short. I recommend plugging it into a 110-volt outlet for long-term monitoring.

IQAir also has an associated software app called **Air Visual**, which displays an indoor air quality score called "US AQI," CO₂ concentration indoors, and relative humidity. You have an option to select a local outdoor weather station as a reference to compare with indoor

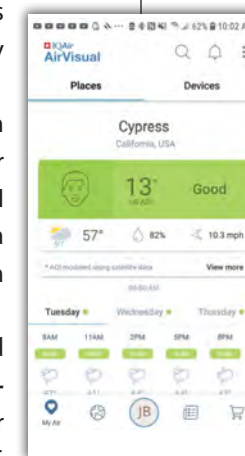
air quality you are measuring.

This product is for Performance-Based Contractors concerned with testing-in and testing-out system performance so they can fine-tune their recommendations to customers. The Air Visual Pro provides a way to quantify the impact their renovations have on customer's homes.

When we test-in before and test-out after repairs are made, we have data to show improvement. Remember, if you're not measuring, your just guessing.

For more information or to purchase, go to ncilink.com/0520AVP.

— By Justin Bright, Field Coach and Instructor, National Comfort Institute





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EQUIPMENT STICKERS

We Live in Interesting Times

The spring of 2020 will go down in history as being one of the strangest periods for this country and the world. With the wildfire spread of the novel Coronavirus (COVID-19) and the subsequent shut down of the world's economies, being in business is so much harder. Homeowners are sheltering in place and frequently are too worried about their safety to let service contractors into their homes.

In Cleveland, OH, one contractor – DiMarco & Associates – has certainly seen their service business fall off. But according to company owner and president, Ben DiMarco, this is not a major issue for him. You see, his company is diversified. No eggs are in the same basket, so to speak.

DiMarco & Associates began life in March 2005 as a testing and balancing consulting company. Today 70% of its \$5 million in gross revenues come from

the commercial marketplace and 30% is residential. Within those two main markets, the company offers a wide variety of services and disciplines to help their customers be safe, comfortable, and healthy in both their commercial and residential environments.

This is, as Ben DiMarco says, in the firm's "DNA" and because of this, they are successfully weathering the COVID-19 storm.

"I like to think of our company in a perpetual state of metamorphosis," he says. "Part of that is how my management team, which includes our Service Manager Henry Sterling and a few other key people, think about and approach continuous performance improvements."

I believe this is what makes us unique in our marketplace. Because of that, we've been able to keep everyone working and earning



Ben DiMarco



while simultaneously keeping our customers safe and working as well."

A SPECIALTIES SPECIALIST

DiMarco adds, "What is cool about this company is our ability to work on really large commercial/industrial projects as well as small residential ones. Being diverse is a huge saving grace, especially during times like now. But it can be difficult too."

He says it requires ongoing studying and training. It means being on a quest to always get better at what they do.

"You have to be willing to learn about and work on things you may never have worked on before – like hydronics, for example," he says.

DiMarco and Associates operates not only in the residential, commercial, and industrial arenas, but they perform service, installations, new construction, retrofit, Design/Build, and a lot of system optimization and retro-commissioning. And they do this with just 28 employees, two of whom are part-time. That means most of the field personnel work both residential and commercial projects.

"That can be difficult for some technicians," he continues. "It means one day you're installing a residential air conditioning replacement, the next day you are working on a 20-ton commercial rooftop system with zoning on a new construction site. That can be daunting. It requires plenty of organizational skills and compartmentalization."

"But it keeps them busy and they are very happy about that."

Today, he says the difficulties of



Henry Sterling



such transitions are only enhanced with the need for social distancing and new handwashing protocols. "For me, the difficulties of running this kind of operation are to focus on thinking ahead of potential hurdles and how to leap over them."

SOME HISTORY

Ben DiMarco worked in and out of the contracting business (for his father's company) for years and eventually settled working for a national consulting engineering firm with Cleveland offices. This company's focus was on commercial/industrial building commissioning. It was during this time that Ben began taking classes with National Comfort Institute (NCI). In fact, he met Rob Falke during an air balancing class at a local supply house.

Later, when his employer decided to relocate Ben to their Washington D.C. office, Ben opted out and went back to work in his father's HVAC business.

"Part of why I am who I am today is because I was exposed to top-notch technicians in the field," he says. "I also had an opportunity to see so much bad work in the field. Up until the late 1990s, my father's company was disciplined like you wouldn't believe. The service technicians attended training classes regularly. There was also sales

training and a lot of discipline in their work ethic."

"The jobs being installed were almost works of art. The technicians were true craftsmen. Their workmanship was just excellent. There were details and specifics on how things were done," Ben continues.

"In the last 10-to-20 years, much of that work ethic has evaporated from the HVAC Industry. In my opinion, what NCI does brings back the concept of commissioning and delivering the project that was promised. It's not just about air balancing. It's about doing everything correctly through measurement, diagnostics, repair, and re-testing. NCI truly teaches quality control," he adds.

PERFORMANCE-BASED CONTRACTING™

DiMarco says he believes that NCI's Performance-Based approach is a return to craftsmanship. "That sets us apart from most of our competitors."

He also says that craftsmanship isn't easy. "It takes time. It takes commitment to training and education. And it takes patience as you work through the typical problems that any change brings with it."

"Air Balancing is the basis of everything we do that I call performance-based. But along with that, the com-

missioning, and the concept of really checking out a system to ensure it is doing what it is supposed to do is equally important. To me, they go hand-in-hand."

"Air Balancing is the foundation for us. When you attach all the other performance components, you then can see how a system is supposed to work."

In the real world, DiMarco says there are no HVAC systems out there, commercial or residential, that are working at 100%.

He says, "If you can get them working in the 90% range – and that includes airflow, electrical, venting, waterflow, combustion, controls – the whole nine yards, there are just so many opportunities for more business. Then you must communicate that to customers in terms of how they benefit. When you look at the performance approach in this way, it is obvious that there is an endless stream of business out there for you."

DiMarco explains that the secret, at least for his company, is to get your field team to look beyond the symptoms causing customer pain and to find the root of those problems. Again, he says he relies on Henry Sterling as a big part of this.

"Henry has been an NCI 'air-head' for 20 years!"

"This is not easy, and it takes time," he adds. "I think we are way ahead of other companies in our area because we think like this, we are trained for this, and we work like this."

THE IMPLEMENTATION PROCESS

DiMarco has been involved with and believed in the Performance-Based Contracting process practically from

the beginning of the foundation of NCI. He has been a member since 2000, was one of the first contracting organizations to become part of National Balancing Council (a subsidiary of NCI) in 2006, and has been training his team every year since then.

“Training is paramount. We do as much training weekly as possible and each year we increase our spending on outside training for our personnel,” he says. “That training is both technical and non-tech.”

He explains that they probably spend 2000 man-hours on training (formal and informal) across all DiMarco’s employees.

“And that is not enough. It should probably be twice that,” he adds.

“The training has paid dividends

however. Senior techs and apprentice techs are performing performance-based tasks and they are seeing the results for themselves.

Why? “Because you have to build a culture that is different than your team is used to,” he says. “Change is hard. But our guys are slowly getting into it and we now have technicians who insist on getting airflow and combustion right. They follow our protocols for testing-in and testing-out.

“Implementing performance is easier for us in the commercial arena because there is more of an awareness for the need from our architect, engineering, and building management clients. They are acutely conscious of expenditures. Not just first costs, but also long-term operational costs.

“Their success depends on their buildings and systems functioning properly – whether it is an office facility, processing plant, and everything in between,” he continues. “They understand the importance of air quality, air exchange, airflow, and system reliability. So they are willing and able to spend the money.”

But the residential business is a different animal. He says that business revolves around customer pain — they call when there is a problem and they want it fixed right away. In those instances, they will pull the trigger on repairs. But they often hesitate when testing shows the need for air upgrades, duct renovations and so on. For DiMarco and Associates, that doesn’t stop them from doing the test-



Recent Hydronics installation that demonstrates a return to craftsmanship.

ing on every job and making a Chinese menu of things that need to be done now and things that can wait.

“This gives customers options and most homeowners like that. But they don’t always buy.”

He says what works for his company is the residential custom home building market. The customer is the builder of high-end homes that sell for between \$2 and \$4 million. DiMarco says they

are not interested in installing cheap equipment or poorly designed delivery systems.

The good news for Ben DiMarco and his team is that they had a lot of this custom work on the books before the COVID-19 pandemic, and he says work still is continuing.

THE FUTURE

DiMarco says he sees opportunities for the HVAC industry as a result of the Coronavirus.

“I am talking about an increased interest in indoor air quality, real measurements, data collection, and a test-diagnose-repair approach. I recently read some engineering articles that talk about a future where buildings will be required to install hospi-

tal-grade HVAC systems to combat future pandemics,” he says.

“Unfortunately, it took an international crisis to make the world see the importance of this approach to building systems, but it is something we’ve all known for years. Now it is at the forefront of everyone’s mind and I think it’s going to stick.”

And that is the approach that is central to how DiMarco and Associates operates. As Ben likes to say, “System optimization, which includes the duct system, is the basis of who we are as a company. It’s in our DNA.”

It is for these reasons and many more that **High-Performance HVAC Today** magazine is pleased to shine our spotlight on DiMarco & Associates of Cleveland, Ohio. 

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Turn to Helping During Times of Crisis!

As of this writing, the government is maintaining its “shelter-in-place” and social distancing rules to help the country get through the Coronavirus pandemic. The media across the country – from local news to the national networks – are all reporting doom and gloom. People are isolated, working from home, and looking for things to do.

Of course, this has wreaked havoc on the economy. With so many small businesses shuttering down and hunkering in place, the struggles both financially and emotionally increase daily and the fear of going out of business becomes stronger each day.

But don't let it!!

Your community needs you. Your local first responders need you. The HVAC industry has a vital role in helping keep people safe in their homes and elsewhere. We can offer peace of mind for those trying to help our sick and injured.

How? By doing our jobs. And by being creative in how we offer help during such a time of crisis.

Working for the community:
Vincent's staffers cutting Merv-13 filter media for use in cloth-sewn face masks.



DO YOUR JOBS

Because almost everyone is stuck at home, their HVAC systems are being used more. Because they are at home, they are beginning to pay much more attention to their comfort levels. And they are certainly looking to be assured that the air in their home is free of contaminants, including viruses.

People are searching online for services to help them in this quest for safety, efficiency, and comfort. Some keywords that are being used more often today include “indoor air quality” and “filtration.” They are calling and trying to find out if these companies are open. They want to know what contractors are doing to keep people safe.

By increasing your communications to customers and the community about how you can help them with these needs, to assure them, you can also keep your lights on and keep your people working and getting paid. Tell people you are open! Tell them how you can help.

For example, tell them that repairing duct leaks, changing filters, testing, and monitoring for proper combustion in gas-fired equipment, fine-tuning air conditioning units, using UV decontamination systems, and so on will certainly help keep them safe, save energy, and be comfortable.

Of course, this means you have to keep your people safe while they are working in homes. That means proper personal protection equipment (PPE) must be provided and social distancing practiced. In other words, your people need to wear facemasks and gloves, and wash their hands regularly.

PERSONAL PROTECTIVE EQUIPMENT

I have written many articles on how to get creative with your marketing – traditional and using social media. You can read those here [https://](https://news.online-access.com/)



news.online-access.com/.

However, with the pandemic still in full force, that creativity should also include how you protect your technicians in the field and your customers in their homes. Personal protection equipment is in such high demand by our frontline medical professionals that there is a severe shortage. So how do you protect your people and customers?

In late March, early April the U.S. Centers for Disease Control (CDC) recommended Americans begin to wear non-surgical medical masks in public. These include the use of “do-it-yourself cloth coverings” as a way to continue flattening the Coronavirus infection curve.

Almost overnight the Internet exploded with articles, blog posts, and YouTube videos showing you how to create cloth masks. Most of these just aren't protective enough, certainly nowhere near as good as the masks worn by medical personnel.

As an HVAC contractor, how can you procure truly safe masks for your people? Well, here's a thought -- how about making them out of MERV-13 filters?

I got this idea from one of our con-

tractor customers who found that pleated pocket-style masks work well with a Merv-13 inserted in the pocket.

MERV 13 is the minimum-rated filter efficiency you can use to stop virus nuclei contained in droplets. Because the design does not incorporate plastic, the masks can easily be sterilized in an oven and then reused. The other thing that makes the masks ideal is that most contractors have easy access to MERV-13 material in the filters they sell.

Obviously, this type of mask is not medical grade, but it is probably the best protection currently available for your team and the public.

The biggest benefit I discovered about providing masks for your team, is that by wearing one, you become hyper-aware that you are wearing it. This keeps you focused on the situation and the potential dangers of contamination by touching things around you. As an added benefit, it keeps the wearer from inadvertently touching their mouth or nose should they touch an object the virus has contaminated.

By the way – these masks can be cleaned and sterilized!! The fact is, viruses cannot survive at temperatures over 145F. So by putting the entire cloth mask with the filter inside, into an oven preheated to 170F for 30 minutes should sterilize it without damaging any of the material, filter or elastic.

Imagine the looks on your technicians' faces when you deliver two masks to their homes – one for them and the other for their spouse. That is what Vincent's did and trust me, it went a long way toward building employee confidence, dedication, and loyalty.

GETTING CREATIVE

But why stop there? You can also share the “recipe” for making these masks with your entire community. Check out how Vincent's Heating and Plumbing has done this on their web page: www.vhpin.com/masks.

Vincent's is providing two free MERV-13 mask inserts per family. They are using an online sign-up form and also providing step-by-step instructions on how to make the masks as well as how to sterilize them.

The website also includes contact information for local seamstresses who can sew the cloth parts of the masks if the homeowner doesn't feel they have the skills to do it on their own.

Remember, this is a FREE service. It is a terrific way to help consumers ease their worries and it keeps your company at the forefront of their minds when they need help.

It's also important to remember that your messaging to the public is critical at this time. Vincent's Owner Daniel Squires also posted a video that highlights his facemask program and he even demonstrates how to wear the masks! You'll find that on the same page as the mask info, just scroll down.

Armed with these Merv-13 masks, your team can be safer, and you can help your customers feel safer too. Now you have to pump up the communications and let everyone know about it. Send out newsletters. Do social media campaigns. Send out direct mail. In other words, don't stop running the business. If anything, pick up the pace and let the community know you are there for them.

Part of this can include creating a Corona Virus Company Statement.

Here is a free editable template you can download to do just that: ncilink.com/C-19Statement. Also, here is a sample Public Service Announcement you can customize for use in any local newspaper, television station, or radio show: ncilink.com/C-19PSA.

Finally, you can even help customers keep sane during these trying times with helpful tips and FAQs they can use right now with their families at home: ncilink.com/C19SocialPosts.

You can do similar things on your website or you can link to these.

BE THE HERO


Being creative with a program like this does several things for you, your team, and your community. First, it shows how much you care for the team

and that you are looking out for their well-being. For your community, you can become a hero. You are demonstrating how you are stepping up while at the same time moving your company up to the center of the conversation. And in the end, the benefit to you is the continued operation and success of your HVAC company.

If the comments we've received from members of our community are any indicator, the idea of MERV-13 masks is catching on very quickly. Within the first few days of posting on our Facebook pages and some PSA time our local radio stations donated to us, we've had more than 700 requests, including requests from nurses and other caregivers.

The next step is to be sure your

technicians do their jobs correctly. Your trained and certified technicians should properly test, measure, diagnose, and repair customers' HVAC issues and then assure customers they are safe in their homes.

When things finally get back to some semblance of normal, you will be heroes and experts that your community remembers and turns to in their hour of need. 



Dave Squires is the president of Online-Access, Inc. – a subscription-based company that works with HVAC and plumbing contractors across North America to help use the Internet as more than an electronic refrigerator magnet. He is also co-owner, along with his brother Daniel Squires, of Vincent's Heating and Plumbing in Port Huron, MI.

Why Design HVAC Systems Using Manual J Load Calculations

I was sitting back in my office jawboning with my friend Bob about the weird Central Texas weather we are having when he suddenly blurts out, "It's raining in my house."

I lean forward into the phone. Bob continues, "Our house is brand new, 2500 sq. ft. in size, and has a high-efficiency five-ton air conditioning system."

"We're putting towels under the tall windows and French doors in the living room to keep the water off the hand-scraped walnut flooring. The doors are swelling, plus our forearms are sticking to the arms of the leather couch," he adds.

I've lost count how many times I've heard the same kind of story. I've become a first responder. In fact, my first response is, "Bob, did anyone do a Manual J Load on your new house?"

"I read about that on your Manual J Design website," he answers. "So, I asked my builder if they had one. He asked the HVAC guy for it. A couple days later the builder calls me and he says the HVAC guy did a modified Manual J, but now can't find it. His computer crashed. So, I thought I'd better call you," Bob continues.

"The things that you say about Manual J and the problems with over sizing make so much common sense. Would you be willing to help us out?"

To avoid this scenario, every HVAC contractor should design HVAC systems using Manual J load calculations, Manual S equipment selection, and Manual D duct design methods. We began performing computer-based load calculations at our service company 27 years ago. Over the years basic design methods haven't changed that much, but the housing stock has.

RULES-OF-THUMB NEED TO EVOLVE

Good design methods from the 1970s gave us a reliable rule-of-thumb for houses built in the 70s.

However, each time building practices and codes change, the rules-of-thumb should have changed along with it. They didn't. By the 1990s, 650 sq. ft./ton could be used on many houses. It wasn't.

After the year 2000, major code changes drove that ratio up to 750 sq. ft./ton. Yet 500 sq. ft./ton still ruled the design world. Who knows? It may rule longer than Queen Elizabeth.

How do you guess the size of equipment for a 1500 sq. ft. house built in the 1970s, upgraded with foam in the attic, and all new windows?

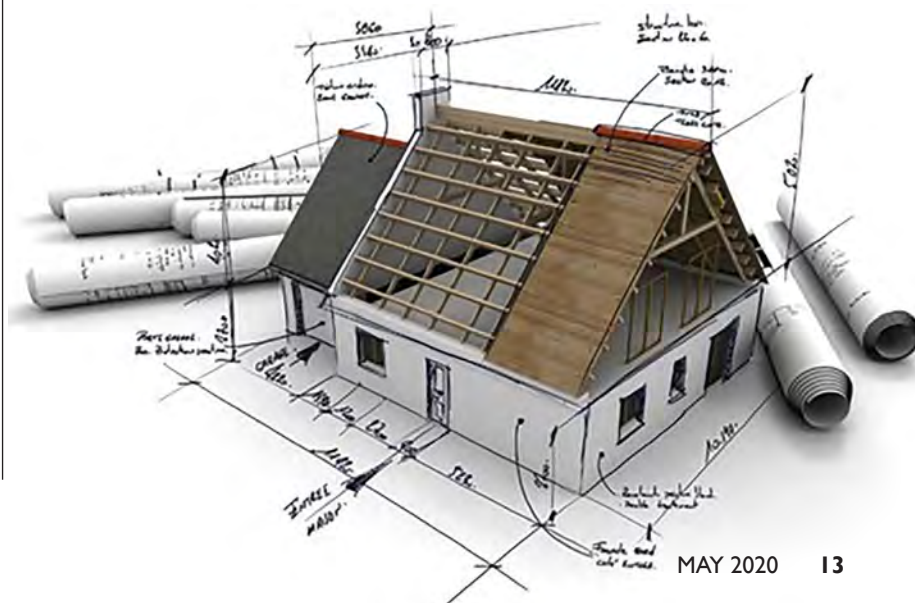
You shouldn't.

LOCAL CODES HAVE EVOLVED

Many local codes now require Manual J and Manual S calculations for every new home and every remodel that changes the house loads.

Sadly, very few contractors know how to properly execute either calculation. The typical HVAC contractor still selects an air conditioning system for a home based on their trusty 500 sq. ft./ton rule.

Unfortunately, most contractors are afraid to change this long habit of 'guesstimating.' This 'fear factor' holds many contractors in design paralysis. They are more comfortable with a familiar problem





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than an unfamiliar solution.

For example, the effective R-value of a building envelope is dramatically increased by using spray foam and other high-efficiency insulation measures such as SIPs, ICFs, and dense pack cellulose. It makes sense that the size of the air conditioning equipment should decrease, right?

We've spent decades redesigning, testing, measuring, and rescuing homeowners from their poorly designed HVAC systems.

We've seen how stuck our industry is on silly traditions. Folks are willing to spend tens of thousands of dollars to have a quiet comfort system in their home. But we aren't willing to spend half a day to design the system right, or several days learning HOW to do it right.

MAKING SENSE OF MANUAL J

HVAC contractors are in the **environmental air conditioning business**. This is defined as treating air to control temperature, humidity, cleanliness, ventilation, and circulation to meet human comfort requirements. It is the responsibility of the HVAC contractor to properly match equipment size to the heat load of the house, then design the necessary dehumidification functions, and provide adequate mechanical ventilation for today's tighter, potentially more "toxic" indoor environments. It's not that hard to do.

Part of the problem, and I hear this a lot, is that the results of a heat load calculation don't make sense. As my friend and colleague, David Richardson is known to say, "When you know the truth, you will understand the confusion."

So, let's look at several reasons why

System Configurator - Residential Expanded Ratings^(Cooling)

EXPANDED COOLING DATA - GSX160361F/AVPTC37D14B*

Printed on: 04/14/2020

AHRI REF#:202544186

SEER:16.0

EER:13.0

Rated CFM:1145

[Back to search page](#)

		Outdoor Ambient Temperature (°F)																								
		65				75				85				95				105				115				
		Entering Indoor Wet Bulb Temperature (°F)																								
IDB	AirFlow	59	63	67	71	59	63	67	71	59	63	67	71	59	63	67	71	59	63	67	71	59	63	67	71	
1050	MBH	35.8	36.3	37.4	-	35.5	36.0	37.0	-	34.5	35.0	36.1	-	32.9	33.4	34.5	-	30.9	31.4	32.5	-	29.1	29.6	30.7	-	
	S/T	0.66	0.58	0.44	-	0.65	0.56	0.44	-	0.69	0.61	0.47	-	0.71	0.63	0.49	-	0.73	0.65	0.51	-	0.79	0.71	0.56	-	
	kW	1.95	1.95	1.94	-	2.17	2.17	2.16	-	2.41	2.41	2.41	-	2.68	2.67	2.67	-	2.97	2.97	2.97	-	3.32	3.31	3.31	-	
70	1145	MBH	36.1	36.6	37.7	-	35.8	36.3	37.4	-	34.8	35.3	36.4	-	33.2	33.7	34.8	-	31.2	31.7	32.8	-	29.4	29.9	31.0	-
	S/T	0.69	0.61	0.47	-	0.70	0.62	0.48	-	0.73	0.65	0.51	-	0.75	0.67	0.53	-	0.77	0.69	0.55	-	0.82	0.74	0.60	-	
	kW	1.99	1.99	1.99	-	2.21	2.21	2.20	-	2.45	2.45	2.45	-	2.72	2.72	2.71	-	3.01	3.01	3.01	-	3.36	3.36	3.35	-	
1350	MBH	37.0	37.5	38.5	-	36.6	37.1	38.2	-	35.7	36.2	37.3	-	34.1	34.6	35.7	-	32.1	32.6	33.7	-	30.3	30.8	31.9	-	
	S/T	0.74	0.66	0.52	-	0.74	0.66	0.52	-	0.77	0.69	0.55	-	0.79	0.71	0.57	-	0.81	0.73	0.59	-	0.87	0.79	0.65	-	
	kW	2.08	2.08	2.07	-	2.30	2.30	2.29	-	2.54	2.54	2.54	-	2.81	2.80	2.80	-	3.10	3.10	3.10	-	3.45	3.44	3.44	-	

1050	75	1145	MBH	35.8	36.3	37.4	39.0	35.5	36.0	37.1	38.7	34.5	35.0	36.1	37.8	32.9	33.4	34.5	36.1	30.9	31.4	32.5	34.2	29.1	29.6	30.7	32.3
			S/T	0.79	0.71	0.57	0.42	0.80	0.72	0.58	0.43	0.82	0.74	0.60	0.45	0.84	0.76	0.62	0.47	0.87	0.79	0.65	0.50	0.92	0.84	0.70	0.55
			kW	1.95	1.95	1.94	1.90	2.17	2.16	2.16	2.18	2.41	2.41	2.40	2.42	2.67	2.67	2.67	2.89	2.97	2.97	2.99	2.96	3.32	3.31	3.31	3.33
1350	1145	MBH	36.1	36.6	37.7	39.4	35.8	36.3	37.4	39.0	34.8	35.3	36.4	38.1	33.2	33.7	34.8	36.5	31.2	31.7	32.8	34.5	29.4	29.9	31.0	32.7	
		S/T	0.83	0.75	0.61	0.46	0.84	0.76	0.61	0.47	0.86	0.78	0.64	0.49	0.88	0.80	0.66	0.51	0.90	0.83	0.68	0.53	0.96	0.88	0.74	0.59	
		kW	1.99	1.99	1.98	2.00	2.21	2.21	2.20	2.22	2.45	2.45	2.45	2.46	2.72	2.71	2.73	3.01	3.01	3.01	3.02	3.36	3.36	3.36	3.37		
1350	1145	MBH	37.0	37.5	38.6	40.2	36.7	37.2	38.2	39.9	35.7	36.2	37.3	39.0	34.1	34.6	35.7	37.3	32.1	32.6	33.7	35.3	30.3	30.8	31.9	33.5	
		S/T	0.87	0.79	0.65	0.50	0.88	0.80	0.66	0.51	0.90	0.83	0.68	0.53	0.92	0.85	0.70	0.56	0.95	0.87	0.73	0.58	1.00	0.92	0.78	0.63	
		kW	2.08	2.08	2.07	2.09	2.30	2.29	2.29	2.31	2.54	2.54	2.53	2.55	2.80	2.80	2.80	2.82	3.10	3.10	3.09	3.11	3.45	3.44	3.44	3.46	

1050	80	1145	MBH	36.0	36.5	37.6	39.2	35.7	36.2	37.3	38.9	34.7	35.2	36.3	38.0	33.1	33.6	34.7	36.3	31.1	31.6	32.7	34.3	29.3	29.8	30.9	32.5
			S/T	0.82	0.84	0.70	0.55	0.83	0.85	0.71	0.56	0.85	0.87	0.73	0.58	0.87	0.89	0.75	0.60	1.00	0.92	0.78	0.63	1.00	0.97	0.83	0.68
			kW	1.95	1.95	1.94	1.96	2.17	2.17	2.16	2.18	2.41	2.41	2.41	2.42	2.68	2.67	2.67	2.89	2.97	2.97	2.99	2.96	3.32	3.31	3.31	3.33
1350	1145	MBH	36.3	36.8	37.9	39.6	36.0	36.5	37.6	39.2	35.0	35.6	36.6	38.3	33.4	33.9	35.0	36.7	31.4	31.9	33.0	34.7	29.6	30.1	31.2	32.9	
		S/T	0.96	0.88	0.74	0.59	0.97	0.99	0.75	0.60	0.99	0.91	0.77	0.62	1.00	0.93	0.79	0.64	1.00	0.96	0.81	0.67	1.00	1.00	0.87	0.72	
		kW	1.99	1.99	1.99	2.00	2.21	2.21	2.20	2.22	2.45	2.45	2.45	2.46	2.72	2.72	2.73	3.01	3.01	3.01	3.02	3.36	3.36	3.36	3.37		
1350	1145	MBH	37.2	37.7	38.8	40.4	36.8	37.4	38.4	40.1	35.9	36.4	37.5	39.1	34.3	34.8	35.9	37.5	32.3	32.8	33.9	35.5	30.5	31.0	32.1	33.7	
		S/T	1.00	0.92	0.78	0.63	1.00	0.93	0.79	0.64	1.00	0.96	0.81	0.67	1.00	0.98	0.83	0.69	1.00	1.00	0.86	0.71	1.00	1.00	0.91	0.76	
		kW	2.08	2.08	2.07	2.09	2.30	2.30	2.29	2.31	2.54	2.54	2.54	2.55	2.81	2.80	2.80	2.82	3.10	3.10	3.09	3.11	3.45	3.44	3.44	3.46	

those heat load calculations don't make sense.

If we fail to accurately describe the essential elements of the house that affect the load, our results won't make sense.

Manual J is a building science-related engineering calculation that helps put value on a structure's ability to resist the loss and gain of heat under specific climate conditions.

The information we input describes structure design elements such as window energy efficiency, insulation values, orientation of the house, etc. Calculation output tells us the rate of loss and gain of heat measured in Btuh's (the building load).

BUILDING LOAD VS. EQUIPMENT CAPACITY

It is an all-too-common mistake when completing a Manual J load calculation to look at the results and say something like, "It looks like the house needs a three-ton unit" However, you are only looking at the building load NOT the equipment capacity. When you complete the load calculation you are not even halfway done

with the design process!

If we don't know how to select the right equipment, the performance of our installed system won't make sense.

In the human body, the rate of energy we burn is related to our metabolism. We need a certain number of calories to keep up with the rate we burn energy, or we gain unnecessary weight, or lose it too fast (I should have such a problem). Your heating and air conditioning system works the same way.

We measure the Btuh's of heat the house is losing or gaining (the house's metabolic rate) and we find the right machine to remove or produce just the right amount of heat for best efficiency and comfort.

The Manual S calculation is the part where we measure the calories (Btus) of the machine we put in to match the house's rate of energy transfer. All air conditioning equipment is listed in nominal tons, but that's just a number on the label. The manufacturer produces what is called a "detailed cooling performance" or "extended ratings" chart for each combination of indoor and outdoor equipment that

allows us to de-rate the nominal tonnage for our local climate conditions.

WHICH IS HEAVIER: A TON OF LOAD OR A TON OF EQUIPMENT?

The house load is based on real Btuh's. The standard is 12,000 Btuh make one ton. It takes more than one nominal ton of cooling equipment to match the 12,000 Btuh load.

HVAC equipment is rated in a laboratory at indoor (80°F) and outdoor conditions (95°F) that don't match our real-world definition of comfort or capacity. In the simplest of terms, one ton of output capacity adjusted for my home in Texas is 11,200 Btuh at best. A typical three-ton unit puts out 33,200 Btuh in the field. We absolutely need to know that the same unit only deliv-

ers 25,200 sensible Btuh to lower the indoor dry bulb temperature.

This makes sizing a tricky deal. You don't want to do 500 sq. ft./ton because you will likely oversize a typical system. But you can't order equipment with the 750 sq. ft./ton that the load calculation suggests. Both are wrong.


You must match the real Btuh load without any added fudge factors to the real adjusted equipment capacity for this process to make sense.

Now we're talking comfort.

Oh, did I mention that if you size your equipment right for sensible cooling in July, you will most likely have humidity problems in any humid climate in the spring and fall shoulder seasons. Did you know there are two

peak design days that we must address as HVAC system designers? They are:

- 1.) Peak summer sensible load
- 2.) "Off-peak" or 'shoulder season' peak latent load.

But maybe we should save that discussion for a rainy day. Outside. 



Paul Wieboldt is a principle with the Manual J Design Studio, which provides a nationwide residential HVAC system design service. They also train contractors on how to make sense out of Manual J, D, and S. Training is available at their Texas

Training Center as well as via online webinars.

Check out their website: www.manualJdesign.com. Contact Paul for more information at paul@manualJdesign.com. To get started with a custom design for your project, send an email to info@manualJdesign.com or call 888-799-1326.

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How ComfortMaxx™ Enhances Performance-Based Contracting™

What is ComfortMaxx™? In a nutshell, it is cloud-based software to help HVAC contractors speed up and simplify their testing processes in the field. It is a repository for and calculator of static pressure, airflow, temperature, and Btu test readings. The software also helps customers understand what those readings mean to them, to their home, and their comfort.

This cloud-based platform makes it ideal for use in the field or in the office. Finally, it runs on any device – mobile phone, tablet, or desktop computer.

ComfortMaxx works as follows:

First, the technician measures and records four key system measurements. Next, he or she calculates airflow based on manufacturers' tables or National Comfort Institute (NCI) generic airflow charts. This helps determine whether there is

enough airflow being moved across the equipment. As a result, you can see if the system performs as designed. Finally, ComfortMaxx creates a powerful visual report that helps explain the findings to customers.

And it does more than that. But don't take my word for it. Contractor Greg Vickers of GV's Heating and Cooling in Glenview, IL says, "ComfortMaxx is a great program that is easy to use and doesn't take a lot of time to generate on a sales call.

"We've been using this for some time now and it simplifies the data making it easier for customers to visualize what is going on with their systems," he adds. "You just plug in the numbers from your diagnostic readings and you get real-time performance ratings.

"This is the simplest and most effective process that we've made part of our sales approach. We now add the ComfortMaxx report into our proposal packet, which provides customers with more collateral material. We do this on every sales call. This sets us apart from our competition because we show customers real-time results, no bobble-head stuff," Vickers says.

COMFORTMAXX AND THE PERFORMANCE-BASED CONTRACTOR

The software was designed and built by NCI to provide a process for not only taking measurements, but for storing them and doing calculations. As the saying goes, "If you don't measure, you're just guessing." ComfortMaxx helps remove the guessing part for Performance-Based Contractors and their teams.

For consistency, the software not only provides the guidance as to what measurements to take, but it also tracks those measurements. This helps contractors and technicians follow their progress as they learn how to test and

present their findings.

For GV's Heating, a residential HVAC contracting firm dedicated to the Performance-Based method, this software is pivotal in helping them implement processes and procedures that allow them to discover and truly solve customer issues.

Plus, the software helps contractors identify hidden system issues and improvements that benefit the customer. It also provides leads for future work and documents test-out results to prove your team has delivered what they promised.

Greg Vickers says, "Using the ComfortMaxx record-keeping feature, we have archives we can refer to if the customer chooses not to have us make duct modifications or system chang-

es at the time. When they ARE ready, we can just pull up our measurements and findings and immediately follow up with them."

He adds that he sees more referrals coming from those customers where GV's used ComfortMaxx when diagnosing systems.

"In the past, our customers saw us taking static pressure and temperature measurements. They often questioned us about what we were doing and why our competitors weren't.

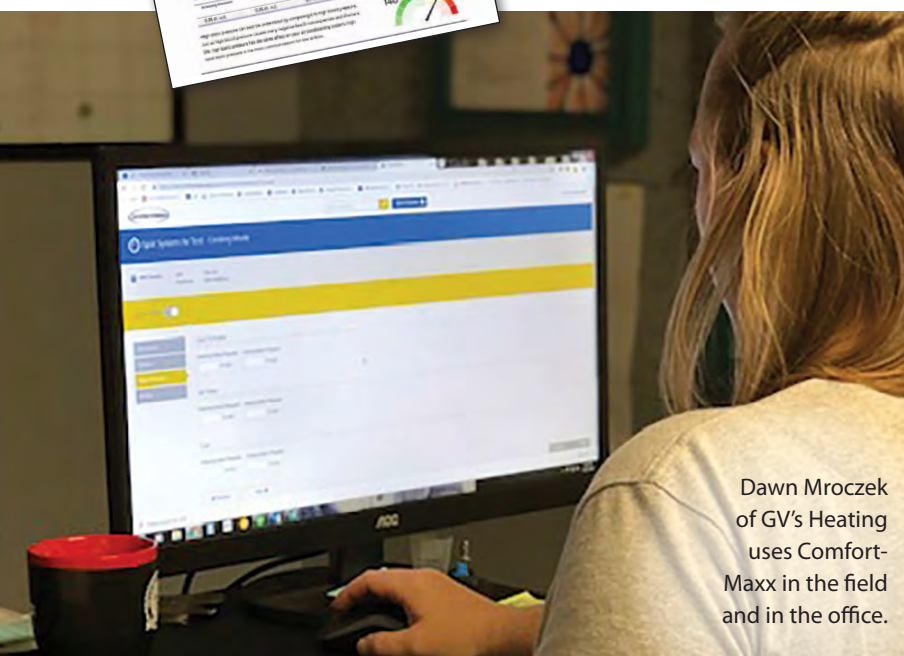
"With ComfortMaxx, we can show them why we do it and they can see how data is so important. I'm talking about real-time data on when we test-in versus when we test-out. This creates true 'Ah-Ha' moments for the customer," Vickers says.

DOES COMFORTMAXX HELP WITH SALES?

For Vickers and his team, using ComfortMaxx has had a definite positive impact. "By adding ComfortMaxx into our sales process, we have seen a closing rate of around 80 to 90%!"

He adds that part of the reason for such success is they provide customers a proposal based on those measurements. This includes what must be fixed right away to resolve their pain points, as well as other things that can be looked at down the line that will further improve the customer's comfort, energy efficiency, health, and safety inside their home.

Not everyone will see those kinds of closing rates, but Vickers says by focusing on performance and doing



Dawn Mroczek of GV's Heating uses ComfortMaxx in the field and in the office.



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MANAGEMENT

what is right for customers, you will see improvements.

He will tell you that it's not an overnight process. It requires knowing how to test and how to interpret the test results. And then you must know how to communicate those results to customers in a way they can understand.

That requires training. In fact, though ComfortMaxx is available to the industry, the prerequisite is that your team needs to be NCI certified to input test data from their field measurements.

THREE LEVELS OF SOFTWARE

ComfortMaxx comes in three 'flavors,' if you will, and its licenses are issued on a subscription basis.

■ The first level is called **Comfort-**

Maxx Air™ (ncilink.com/CMAir). It allows contractors to test system pressures and calculate airflow to generate sales leads for duct system renovation projects.

■ The next level up is called **ComfortMaxx Pulse™** (ncilink.com/CMPulse). It includes everything from ComfortMaxx Air and adds temperature testing and delivered Btu measurement for initial system performance analysis.

■ Last, but certainly not least, is **ComfortMaxx Verify™** (ncilink.com/CMVerify). This is the full level of the software which enables contractors to conduct full system performance testing before work begins and after completing any HVAC system renovations.

"ComfortMaxx helps us to increase our bottom-line profits," Greg Vickers concludes. "It enables us to sell more higher-end equipment. And we can prove to customers that our work truly delivers what we promised."

"We are true believers in the motto, *If You Don't Measure, You're Just Guessing*. By using this software, we have real third-party information that backs up our work. This process puts GV's leaps and bounds above our competitors. This is no smoke and mirrors. There is nothing else like it on the market."


If you are interested in learning more about ComfortMaxx software, please visit the NCI website (ncilink.com/CMaxx) or call NCI's Customer Care line at 800-633-7058. 

PHOTO OF THE MONTH



Before

After

"Let's Get Creative!"

— Nate Miller, Campbell & Company, Yakima, WA

"Downflow won't work? Upflow won't work? No room for horizontal? Let's get creative! We fabricated this custom metal to enable awesome airflow in this very difficult application."

Nate Miller from Campbell and Company is the May 2020 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! 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 JUNE CONTEST OPENS ON MAY 11, 2020.

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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Your May PowerPack Is Here!

Membership has its privileges. One of the great things about your PowerPack is that each one includes items curated just for members to help you as you grow your High-Performance HVAC business.



Some of the tools included each month may not be normally accessible with your membership subscription package. However, you will be able to access these tools

- through this PowerPack portal during the current month.
- So, without further ado, let's drill down and see what's included in the May 2020 PowerPack, which focuses on preparing for the cooling season:
- ▲ **How To Perform a ComfortMaxx™ Quick Test** (Webinar)
 - ▲ **NCI Generic Cooling Capacity Table** (Download)
 - ▲ **Performance Tune-Up Postcard** (Download)
 - ▲ **ComfortMaxx Field Data Collection Report for Residential Split System** (Download)
 - ▲ **The Curse of Hot Weather** (Article).

Be sure to share your May PowerPack with your entire team! So get started today: Go to <http://ncilink.com/PwrPak> to download.

If you have any questions, or if you are unable to access any of the tools in this program, please contact your Customer Care team at 800-633-7058.

HIGH-PERFORMANCE PROJECT AWARD
Have You Entered Your Project Yet?

We are still accepting entries for our inaugural recognition program for High-Performance project excellence. We call this our **High-Performance HVAC Project Award**. The idea is to recognize contractors who do it all – test, measure, diagnose, and resolve residential customer comfort and efficiency issues using the Performance-Based Contracting™ methods taught by NCI.

Read the **High-Performance HVAC Today** Editor-in-Chief's February *Today's Word* editorial for more details. Go to ncilink.com/0220TodaysWord.

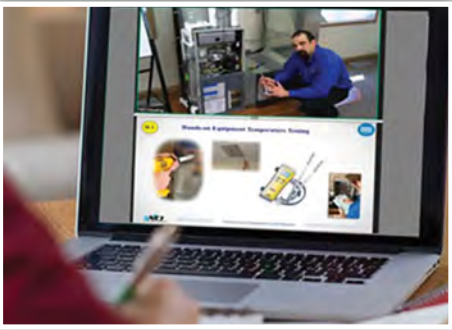
Full contest details can be found here: ncilink.com/HPPADetails.

The entry deadline is **June 1, 2020**.

So please take advantage of this opportunity and enter your project. If interested in participating, please [click here \(ncilink.com/projectawards\)](http://ncilink.com/projectawards) and fill out a brief survey.

Once done, we will reach out to you so you can take the next step.

We look forward to seeing some amazing entries. If you have any questions, please contact Mike Weil at mikew@ncihvac.com.



NCI Offers Distance Learning

During these trying times of social isolation, NCI has been hard at work to create a whole new **Distance Learning** program. You can now send your team for training without them having to leave the house!

NCI offers several types of classes in this program, all of which count toward NATE continuing education credits.

The two types of classes NCI offers are Self-directed and Live-online.

Self-directed class. This is currently our exclusive **Airflow Testing & Diagnostics Online**. It has approximately eight hours of comprehensive training available to you 24/7/365.

Check out the **Airflow Testing and Diagnostics** course, for example, by clicking ncilink.com/SelfDirected.

Live, Online classes are broken into two half-day sections. For example, our **Residential Air-side Online, Commercial Air-side Online, and CO Recertification** classes each consist of two four-hour blocks of training with 10-minute breaks every hour.

Important Note: To participate in NCI Online recertification classes, you must already be NCI certified. As a member, you qualify for a discount on this training, and you can apply NCI Bucks, or earn them.

Furthermore, NCI now offers its new **Explore HVAC Field Performance (ncilink.com/HVACFieldPerfOnline)** class in the Live, Online category as well.

For more information on exactly what Distance Learning Courses are available to you, just call the NCI Customer Care Help Line at 800-633-7058.

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*High-Performance
HVAC Today* magazine
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Our world as we know it may never be the same. All of our lives have changed significantly in 2020. We hear the phrase, "The New Normal" a lot these days. But what does that really mean, and how does it impact our industry, and most importantly, your business?

As we continue to navigate these uncertain waters, and look to the future, we must prepare for a "no longer business as usual" environment. HVAC companies that are proactive will present customers with new approaches and services that are responsive to where we are today.

Even after stay-at-home orders are lifted, there will be a lot of uncertainty about letting outsiders into our homes for many months ahead. The key is to communicate your safety protocols, and how your employees are well-trained to help ensure customer safety.

You need consistent messaging regarding the importance about caring for your customers' and employees' safety. This consistency should be on your website, in your direct marketing, and in all your customer interactions.

PPE: THE NEW NORM

We need to rethink the way we interface with our customers. Even as shelter-in-place rules begin to loosen and the economy opens up again, as a society, we all will have to recalibrate how we interact with each other.

For HVAC service and replacement companies this means making PPE (Personal Protective Equipment) a part of how we do business.

You'll want to make sure your field people are trained on proper use of PPE, and you keep your trucks stocked with masks, gloves, and various cleaning products.

This is key to reassuring your customers that you won't introduce potential contaminants into their home. Once in the home, your employee should explain what he or she will be doing, and how they will help ensure any surfaces they touch are cleaned and sanitized.

VIRTUAL SALES CALLS

"No contact" estimates are being advertised all around us from many industries including HVAC. Have you implemented a "Virtual Sales Call" approach? The technology is pretty simple, with free and low-cost applications like Zoom, Skype, and GoToMeeting. What's most important is having a script and written processes for how to conduct your virtual sales calls, along with the "Low Contact" visits needed to take measurements, and test, and assess system operating conditions.


Your customer can certainly send images from their smart device, giving you a peek at their equipment, possibly even the ductwork - if it's easily accessible. But in truth, there is nothing like actually being in the space.

Also, it may be difficult or even dangerous to send your customer into an attic or crawl space. And remember, a sales call without static pressures and temperature testing could easily miss key issues with the customer's existing system.

LOW CONTACT SERVICE CALLS AND REMOTE MONITORING

You'll want to have processes in place to minimize customer contact during service calls. This includes initial virtual diagnostics with video-conferencing, and making sure that during the service call the customer not be in the same room as your technician.

It's important to relay to your customers the importance of not skipping their scheduled maintenance as well. By putting off a fairly quick and painless maintenance visit, they could actually cause a much more expensive and "higher contact" emergency repair call.

The "New Normal" may also be an opportunity to make remote monitoring part of your offerings. By remotely monitoring key performance measurements you are able to see potential breakdown issues and/or performance degradation without in-person visits. 

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