



RACHELLE MARTINS IS KILLING IT.

SILBERSTEIN:
SIZING COOLING SYSTEMS

AI: *reshaping customer service*

Ask a Jerk **#4**

tech talk: *superheat and subcooling*

Beyond the Credit Score





Congratulations!!

Welcome to the summer 2025 episode of HVAC Tactical Magazine.

A voice of the people.

When we rolled out the very first issue of the magazine, we had a vision to bring the voice of the trenches and the movement to the mainstream.

A magazine for the trenches, by the trenches.

Our goal is simple.

- Provide valuable, relevant content that our fellow tradesmen and tradeswomen in the trenches can appreciate.
- Build awareness of the movement happening on social media and highlight individuals making an impact in the HVACR community.

Content

If you or someone you know has great content that you'd like to see published in the magazine, feel free to reach out. We're always open to chat!

Email us at magazine@hvactactical.com

@hvactactical



Be sure to follow us on social media and get plugged into the community!

Thank you for your support and welcome to the movement!

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*at least, when it comes
to sizing cooling systems*

By Eugene Silberstein



summer 2025

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THE UNSTOPPABLES



Ben Poole HVAC Tactical Founder

Ben Poole is an entrepreneur and 3rd Generation HVAC professional. He founded HVAC Tactical in 2018, the HVAC Tactical Awards in 2020 and the HVAC Tactical Magazine in 2023.

His goal is to simply elevate the industry, reignite the passion for the trade and motivate others to take on the personal responsibility of mastering their craft.



Matthew Pryce Editor-In-Chief

Matthew Pryce is a published author, professional musician, innovative digital marketing maven, and rabbit & traditional husband.

His work has appeared in the Sports Illustrated, The National Review, the NY Daily News, various HVAC publications, and of course, the **HVAC Tactical** magazine.

He is the vice-chair of the HARDI marketing council, and the Head of Marketing Communications for Centrotherm Eco Systems, a plastics manufacturer located in New York.



Rebekah Poole Advertising & Production Manager

Rebekah brings a strong foundation in sales, training, and process development from her years in the automotive industry. Known for her sharp eye and organized follow-through, she moves projects forward and smooths out the rough edges—whether in copy or production.

Raised in a family of contractors, Rebekah feels right at home in the trades. At HVAC Tactical, she connects sponsors and advertisers with opportunities to support the trades, spotlight technicians, and grow brand visibility that resonates.





Ask A Jerk #4

Wow, is it hot out there!!! And, after limping my 27-year-old a/c system along for the last few years, it finally died on the first week of high 90 degree heat this season.

Let me tell you that there was no peace in my house that week. "Oh, you're the fancy HVAC guy with no a/c; YOU ARE A JERK!!!".

Luckily, I was able to "borrow" a few window units to take the edge off while I wait for our new heat pump and air handler to arrive. So, can anyone donate a few hours to my attic this weekend? Me, uh, I have an appointment with a, I mean, I'm busy that day, uh, the dog ate it... Never mind, I'll do it myself. If you don't see this column next month, send the EMTs to my attic.

Q) Dear HVAC Jerks,

We install a lot of new air conditioning systems with ductwork, and we usually do full heat load calculation and manual Ds, but even when I follow the numbers for the btus and airflow cfm, I always have a problem with rooms that have high ceilings. Even when I oversize the ducts, I still can't get the room to cool. Do you have any idea of what I could be missing?

-Devin's not cool

Ok, Devin, I have a thought. This is a fairly common problem, with (usually) simple solution.

In homes with cathedral or high ceilings, getting enough cool air into the area is relatively straight forward, but that's often not the problem. The culprit is usually the return duct. By that I mean, very often the central return grill/duct is in the ceiling of an 8ft high hallway, while the cathedral ceiling is 12ft or more.

Regardless of how much cold air you pump into the big room, if you don't remove all of that hot air at the top, the room will heat up again as soon as the system satisfies. You **MUST** add a return duct as high as possible near the peak, even a small one, if you ever hope to have a chance at cooling that room. That's it. Try it, it works.

Thanks for the question, and good luck.

Q) Dear Jerks,

I started a small service business near St. Louis a few years back, and now I run six trucks, mostly service. I want to keep growing, but I feel like we waste a lot time doing quotes that never happen or going to service calls that we're turned away from because the people already had someone else fix the problem.

I know that everybody gets some stuff like this, but I think we get more.

People seem to like us, and I know our prices are pretty low, but we need to close more jobs. What do you think I'm missing?
- Cliff needs to get more in St. Louis

Hey, Cliff!

Thanks for the question. While I can't diagnose your problem from one paragraph, I will bet that it has something to do with urgency. Whether it's an install, or a service call, when a customer wants something, they want it now!

If you're not getting a service truck there today, or even just a quote for a new installation or swap-out within a few hours of an appointment, your chance of closing that sale diminishes fast. No, even faster than that. The first thing you need to do is to look at your company's culture and admit that you're lacking the urgency needed to get the sale.

You need to act like your customer's house is on fire and you're the only one that can save them! Not only will you dramatically raise your closing ratio, but you'll be surprised at the great reviews you'll get for being so responsive. Oh, and that low price thing, you better take a look at that, too, while you're at it.

Q) Dear Mr. HVAC Jerk,

My husband has been in the plumbing and HVAC industry for a very long time. We have our ups and downs, and sometimes he works long hours, but overall he's given us a great life. HOWEVER, he works so much on everybody else's projects, that when it comes time to fix our equipment or system, he's too tired. Well, now it's 106 degrees in my bedroom, and our 27 year old, scratch and dent, R-22 system that was put together with leftover scraps from other jobs finally \$%&# the bed! He even told me last year that this would happen and he still waited to replace it! As soon as I'm done beating him with his Callaway Paradym, I'm throwing him and his crap in the river!!! What do you think of that!?! Idiot.

Your WIFE!!!


Uhhh,

sorry folks,

I have to go now....

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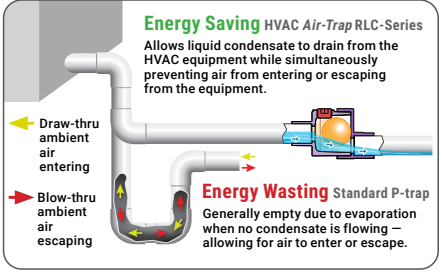
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eugene silberstein

BIGGER is definitely **NOT** better

at least, when it comes to sizing cooling systems

Many of us have been raised with the mentality that more is good and bigger is better. When referring to many things in life, these ideals may have some relevance, but when dealing with others, more definitely equates to less.

Maybe we want to live in a bigger house. Back in the era of the growing housing market, construction companies were building larger and larger homes and average families were snatching them up, since it was, especially before the real estate crash of 2008, a simple matter to obtain a mortgage. Quite often, nothing more than a handshake... No tax returns, no bank account, no problem! Since the houses were being sold, the builders build more. It was indeed a vicious cycle.

But larger homes have costs associated with them. Increased repair costs, increased maintenance costs, higher property and school taxes, and increased utility costs all take their toll over time. When it comes to the selection of cooling equipment, bigger is definitely not better. So why do so many contractors insist on selling their customers oversized air conditioning equipment?

Let me take you back to a conversation I had with my father back in the mid 1980s, when everybody, more or less, had lot of money to spend. Just to set the record straight, I entered this industry in 1980 at the age of 14, which, officially, makes me really old, at least that's what my back and knees keep telling me.

While learning this industry, I often bombarded my old man with questions about our industry in a never-ending quest for every possible answer to every possible question. It was after a meeting with a potential client, that I approached him with a question that, to this day, affects the way

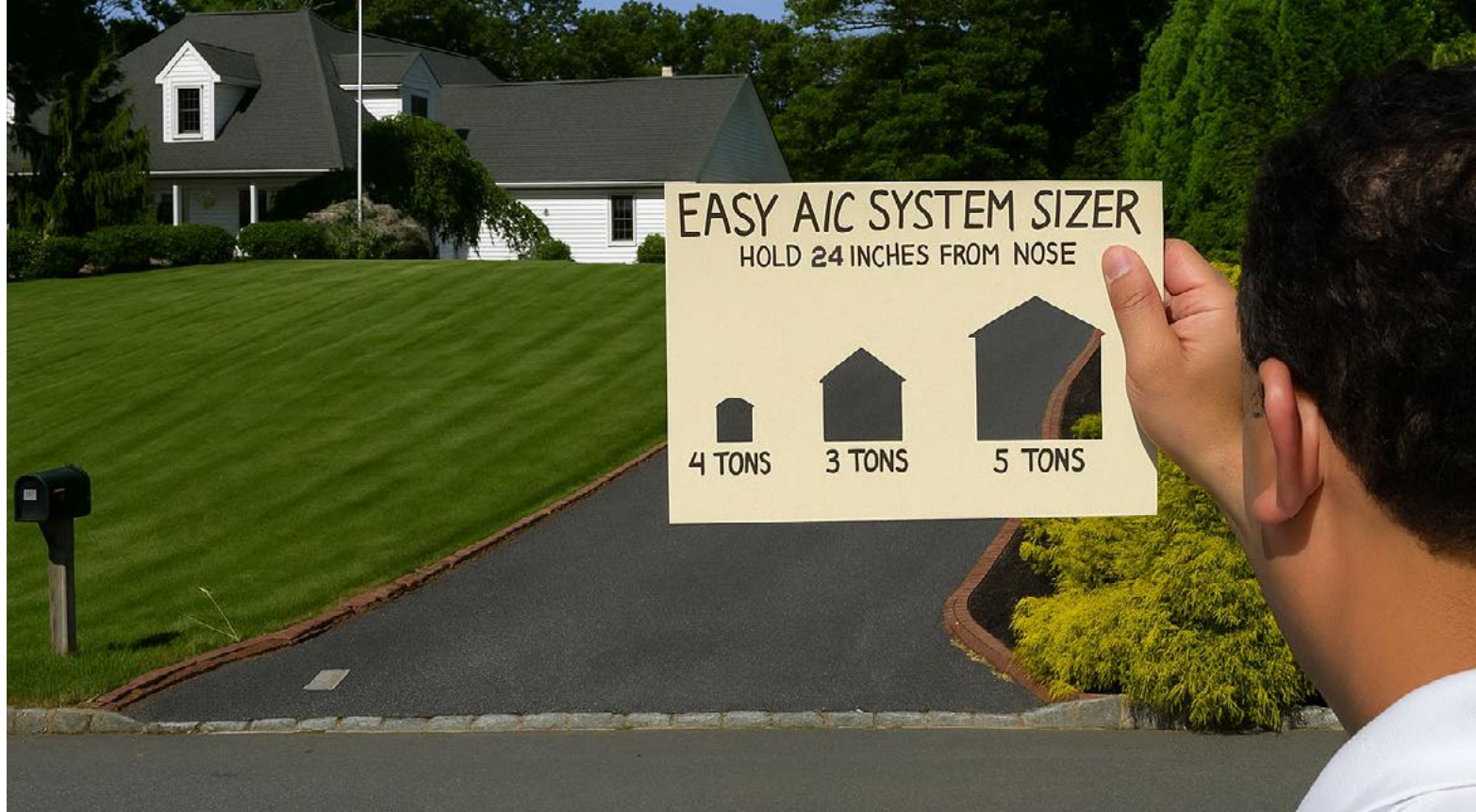
I teach, and approach, HVACR in general. At the meeting, the client specifically asked us to provide him with an air conditioning system that would keep the house at 65°F, even on the hottest day of the year. My father was quick to response with a confident, "Sure thing, we can do that, no problem!".

Needless to say, we were awarded the job and now we had to deliver. My question to my father was simple and to the point. "How are we going to do that?" My father's response was even more simple, direct and to the point. "We're going to install an air conditioning system in his house that will be big enough to cool the entire neighborhood if the customer leaves his doors open! I don't want them calling me up in the middle of August complaining that the house is too warm."

What was evolving seemed to be a fight between my old man and the customer, although the customer did not even know that battle lines have yet been drawn. My father was a very intelligent man, or so I thought, and I was thoroughly confused with the ease with which he threw all common sense and system design knowledge out the double-pane, low emissivity, window.

Even properly sized systems are, for the most part, oversized. In Long Island, New York, where we lived at the time, we typically design our air conditioning systems to operate at an 85°F outside ambient temperature. What happens when the outside temperature is lower than 85°F?

Well, the heat gain of the structure decreases and the capacity of the air conditioning equipment increases. So, our air conditioning system has the ability to provide more cooling when our house actually needs less. If we size our air conditioning equipment using industry-accepted standards



and guidelines, we should be able to use the results of these calculations to size our equipment. What many contractors do is use the results of their calculations as a guideline; and a vague one at that.

If the calculated results indicate that a three-ton air conditioning system is needed, a four-ton system is often installed. Why? "We want to make certain that we did it right... Besides, we don't want the customer calling us up in the middle of August complaining that the house is too warm, do we?"

In the real world, we simply cannot continue to size air conditioning equipment for the one or two days in the summer that put a real strain on the equipment. Why is it that we often size cooling equipment based on the hottest day of the year? By the way, how many times a year do we experience the hottest day of the year? Hmmmm. Well, the hottest day of the year is, by definition, the "most hot", so the hottest day of the year occurs exactly one time a year!

When we perform heat gain and heat loss calculations, we need to be confident with the results of our calculations. If we aren't confident with the results, why calculate in the first place?

So, what are the effects of oversized air conditioning equipment? Where do we start?

Let's take a look:

- Larger air conditioning equipment costs the customer more to purchase
- Larger air conditioning equipment moves more air, so a larger air distribution system is required. This, by the way, also costs more money
- The installation costs are higher because of larger field-installed refrigerant lines, larger pads, larger ductwork, etc.
- Larger air conditioning systems use larger compressors and blower motors, so they use more electrical power to operate
- Electrical installation costs are higher because more electrical power requires that larger conductors be run to the unit location
- Larger cooling equipment will cool the space faster. This potentially results in more frequent system starts and stops, increasing the system's power consumption
- Larger cooling equipment will cool the space faster, resulting in slower inverter-controlled compressor operation. This increases the evaporator saturation (coil) temperature, decreasing the dehumidification effect that air conditioning systems have on the occupied space

- Decreased dehumidification leads to higher relative humidity in the occupied space. This leads to an increase in the possibility of mold growth in the space
- Mold growth in the space puts you, the contractor, at increased risk of litigation as a result of mold-related illness
- Larger equipment costs more to manufacture, to keep in inventory and to ship
- The manufacturing of larger equipment requires the use of more natural resources, including raw materials and energy

By properly sizing air conditioning equipment, customers and contractors alike will benefit. From the customer's standpoint the benefits of a properly sized system include:

- Lower system costs, both from the first-cost standpoint and from the operating cost standpoint
- More even conditioning of the occupied space
- More comfortable living conditions as a result of more even and effective humidity control

From the standpoint of the contractor, a number of benefits can be realized:

- Happier customers
- More customers as a result of word-of-mouth advertising
- More customers based on lower bid prices
- Fewer callbacks on properly operating/sized systems
- Less chance of mold-related litigation
- Did I mention happier customers?
- Did I mention more customers?
- Did I mention more word-of-mouth advertising?

Why will you get more customers from lower bid prices? How so? Glad you asked. If your competitors are using old-school rules of thumb to size air conditioning equipment for a job, the equipment they specify will be oversized 100% of the time. If you take the time to properly size a system to a particular structure, your proposal will be for lower-capacity equipment.

Lower capacity equipment will cost you less to purchase and install, so your estimate price will be lower. If your estimates are lower, you will get more work! Sounds great? Great! So, stop trying to cool the whole neighborhood to make my father happy. He's on the brown side of the lawn now, so he can't complain too much anymore.

Rest in peace dad!

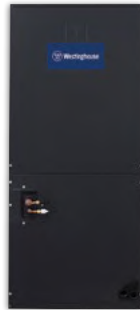
About the author:

Eugene Silberstein

is the author and co-author of many HVACR-related textbooks including the best-selling Refrigeration and Air Conditioning Technology, published by Cengage Learning, presently in its 10th edition. He is currently the National Programs Director at HVAC Excellence, a division of the ESCO Group (www.escogroup.org). Eugene can be reached at (224) 248-9462 or by e-mail at eugene@escogroup.org



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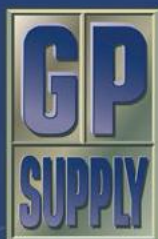
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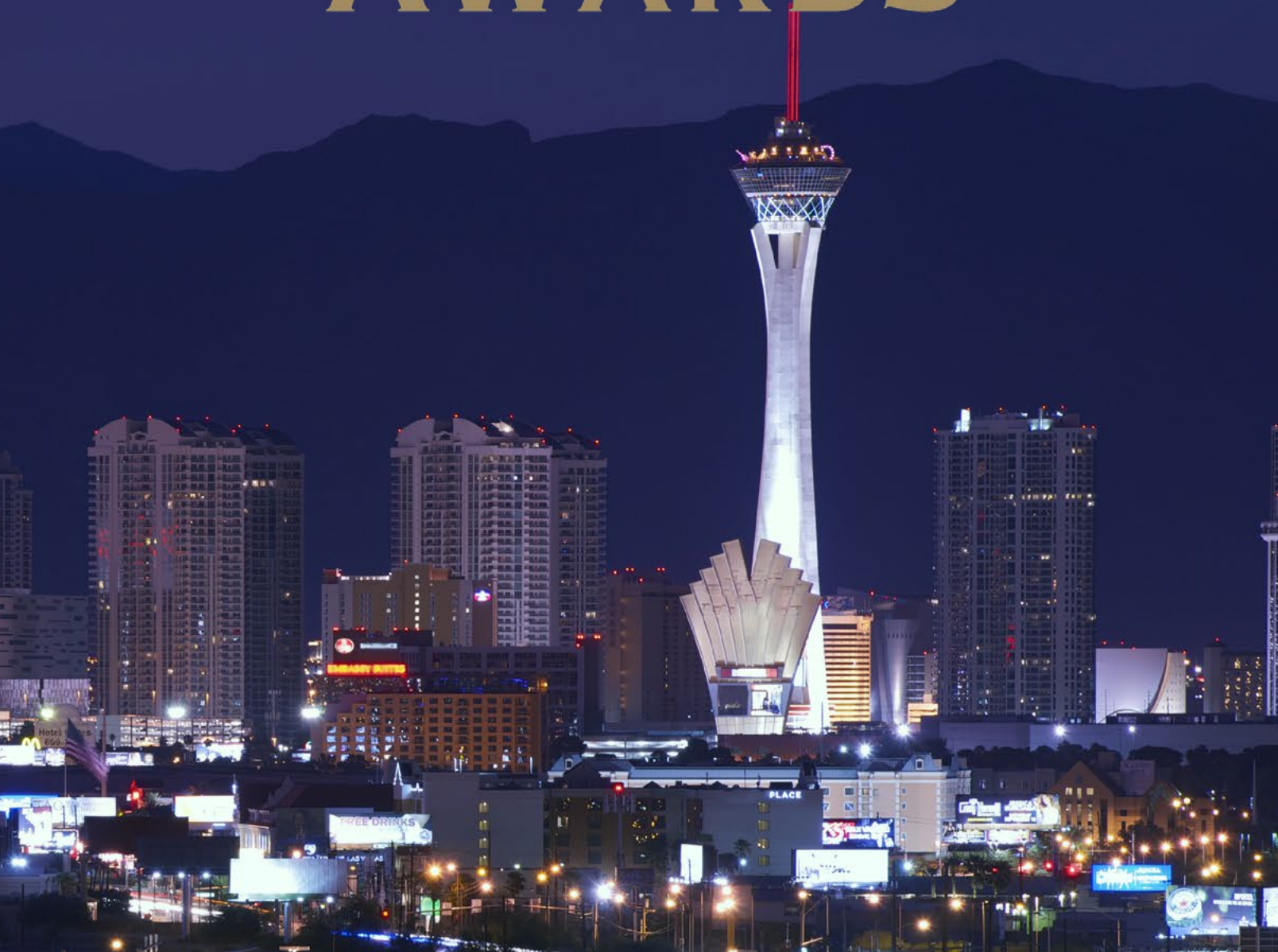


SIXTH ANNUAL AWARDS & GALA

HVAC

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AWARDS



HVAC, plumbing, and electrical platform Redwood Services is set to receive a majority investment from Toronto-based private equity firm Altas Partners, valuing the company at around \$1.1 billion. The deal will mark the second billion-dollar home services platform transaction in the past year, following Goldman Sachs' private equity arm's late-2024 investment in Sila Services.

Meanwhile, two other HVAC, plumbing, and electrical roll-ups – Columbia Home Services and P1 Service Group – are set to merge in a deal that will value the combined firm at around \$325 million, including debt. The deal will mark the first true merger between established private equity-backed home services platforms.

Congress's 'big, beautiful bill' is set to deliver a blow to the HVAC industry, eliminating a pair of federal consumer-facing, HVAC-focused tax credits at the end of this year. "Taken together," ACCA wrote, "these rollbacks would mark the most significant federal retreat from promoting high-efficiency HVACR and building envelope upgrades in over a decade."

A Michigan jury awarded an HVAC technician over \$75 million in a lawsuit against Kroger, following an R-22 explosion that cost him most of his hands. Attorneys argued during the trial that Kroger "failed to properly maintain the refrigeration system and did not provide the required documentation of maintenance, repairs, or inspections,"

the Detroit Metro Times wrote.

Over the past decade, heat pumps have emerged as the industry's growth leader compared to air conditioners and gas furnaces, with shipments climbing 75 percent, from 2.3 million units in 2014 to 4.1 million in 2024, according to AHRI data. Heat pumps eclipsed gas furnaces in units shipped for the first time in 2022 and have maintained that lead ever since.

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RACHELLE MARTINS

IS KILLING IT.

written by matthew pryce



Then you will go on your way in safety, and your foot will not stumble.

Proverbs 3:23

Rachelle Martin's journey has been getting more and more attention as she gains notoriety on the ol' internet. With a growing social media presence on Instagram, an HVAC Tactical award, and a growing career in the field – Rachelle has gone her own way, and her feet have not stumbled.

Her story starts as a social worker in Massachusetts and takes her literally around the world.

When she lands in her new home in North Carolina, she's a mother, a wife, an HVAC installer, a student, a disciple, a partner, a social media personality, and a truly remarkable woman overall.

Humble yourselves under the mighty hand of God, that he may exalt you in due time
1 Peter 5:6

Amid all these accomplishments, future plans, and the general chaos of life – Rachelle not only crushes it all, but resonates a humility that cannot be learned.

In speaking with Rachelle and getting to know her a little bit, there is a radiance of positivity and a measured perspective that sometimes eludes so-called social media influencers.

As these media personalities grow, there is a tendency to shift focus from professionalism in the trade to professionalism online – it can be a natural

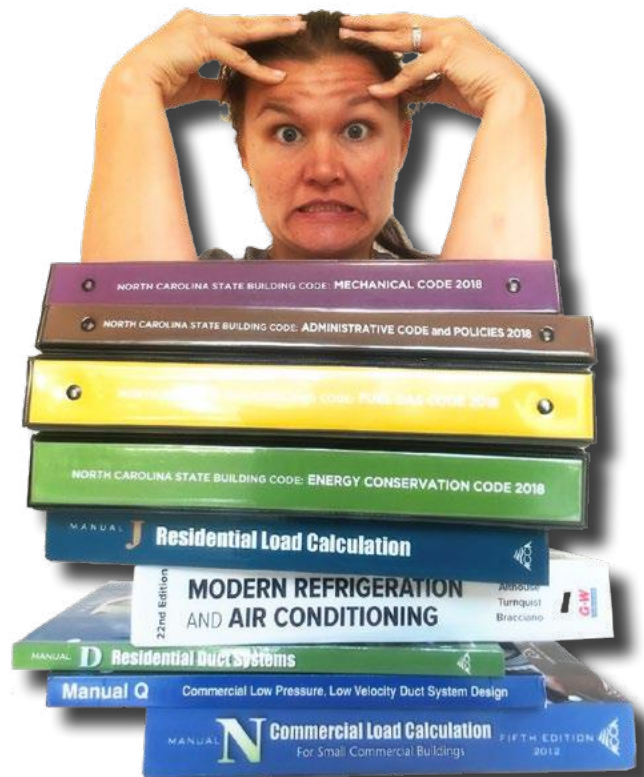
path for some, and prove challenging for others. Given the visibility of the trades in today's online ecosystem, there are many examples of folks who have flown too close to the sun on Instagram wings only to crash back to Earth.

The concept of social media influence itself is still evolving, but make no mistake: Rachelle is a social media influencer. Boasting an upward trajectory approaching a five-figure follower count, Rachelle is known in the industry.

With this notoriety often comes vanity, pride, gluttony, greed, and perhaps even other deadly sins.

But, it's instantly obvious that Rachelle's grounded sensibilities won't allow for such unfocused pursuits.

Her family life, her faith, strategies for the future, and her own personal goals displace any semblance of complacency,



and this drive and determination simply doesn't let any untoward sentiment creep into her positive aura.

But how and where did it all start?

In the beginning Genesis 1:1

Rachelle Harvey (as she was once known) grew up near Hanson, Massachusetts. If you were to ask the Rachelle of 15-20 years ago, where she thought she might be in current day – the likelihood would be a reply not completely matching with her contemporary lifestyle.

For years, Rachelle worked as a social worker. Generally speaking, social work is an incredibly challenging occupation, one that requires improvisation, patience, varied knowledge, and above all, a kind and compassionate heart.

Social work is a field that throws the mediator into the toughest challenges their clients may be facing. This is not a job for someone who is not brimming with sympathy, solicitude, and love.

As the pages of the calendar fluttered past, the rising cost of living led Rachelle (now Martins), and her entire extended family to start investigating parts of the country where they could build the life they wanted.

It was her husband Ighor who first landed a job, prompting a migration down the eastern seaboard.

And with that, the Martins clan (and more) became citizens of the great state

of North Carolina.

**Remember ye not the former things,
neither consider the things of old
Isaiah 43:18**

Flash forward about a decade to today – The Martins are flourishing Tar Heels, and both Ighor and Rachelle work for the same company – one of the largest residential hvac service & installation companies in Raleigh NC.

Specializing in installations, Rachelle's IG is a fun blend of a lot of different things, but the foundation remains the same: focus on the trades.


Be sure to give her a follow @hvac_install_ her and you'll receive a splendid gumbo of valuetainment – a silly portmanteau that has helped shape the methodology of many creators in the trades and beyond. Rachelle's content runs the gamut from the grittiest of jobsite phenomena to fully polished red carpet photography as she prepares to accept some well deserved accolades (more on that in a bit).

Scroll a little further and investigate a little deeper, and Rachelle's focus zeroes in on three distinct Fs.

Family, faith, and fitness. (The body is a temple, after all!)

It all fits together nicely, showcasing someone with a good idea about who she is and what she wants out of this world.

Rachelle looks just as at ease deadlifting a bunch of plates as she does troubleshooting an air conditioner. There



are plenty of pics of her crushing it in the gym, doing CrossFit, and generally staying active.

Just so, the loving photos of her and her husband, her entire family on their travels (they do appear to be New England Patriots fans, but we won't hold that against them much), and just the day-to-day stuff – the same humble positivity radiates through it all.

***I am a sojourner of the earth.
Psalm 119:19***

Now, a mother of two, a world traveler, and one of the top installers in the game and on social media – life is both the same and different for the crew.

During our chat, Rachelle couldn't contain her excitement

as she is planning the next epic journey to Europe. This next adventure (coming Summer 2025) takes them from Berlin to Athens. Part of the fun is the spontaneity.

Rachelle's picked the starting point and the end point, and will be filling in the gaps with sights, sounds, smells, food, laughter, memories, and love with her family along the way.

This next epic road trip through Europe comes on the heels of a previous one. That excursion took the fam to France, Belgium, The Netherlands, Germany, Switzerland, and Italy.

Tremendous football fans, The Martins crew's first destination was the Olympics in Paris.

Reflecting on the grandeur and meaningfulness of the previous trip, she can't help but feel exhilarated for what lies in store on the next one.

And amid it all, Rachelle's humility remains central. She knows these trips are an incredible blessing for her and

her family. Her sons, Wesley (11) and Thomas (9), have already visited more countries than the average American will see in their lifetime. (Additionally, they've visited Ighor's birthplace of Brazil as well.)

For Rachelle and her family, the road ahead is wide open and exciting.

**For those who exalt themselves
will be humbled, and those
who humble themselves will be
exalted.
Luke 14:11**

It has been nearly half a year since Rachelle Martins coolly sauntered to the stage to accept her Lady of the Trade Award this past February in Orlando, Florida. She had previously been nominated (in the same category), but it was this year that she finally emerged holding the trophy.

Shespeaksabouttheexperienceinboth surreal and completely rational terms. Never expecting this type of direct and

public acknowledgement from her peers, she does not downplay the astonishment and gratitude now that such a coveted award sits on her shelf.

Once, the likes of Jeff DeMassari and Michael Flynn were figments of Instagram fantasy, a mere collection of pixels on a smartphone sharing



best practices and inspiring tradespeople from afar – now, she stands shoulder to shoulder with these giants of HVAC and calls them colleagues and friends.

Once, she turned to these social media luminaries for advice – now, she's giving the advice and providing that inspiring foundation for others entering the trade – a full circle, complete with various arcs culminating with a speech in front of the top people in the industry.

Laughing, Rachelle said she was almost glad she didn't win in 2024. "I didn't know you had to make a speech" she said. After seeing other winners get up and accept the award, she was "lucky I didn't win" as Jennifer Manzo took home the prize in her nominated category.

The next year, upon returning to the HVAC Tactical Awards & Gala – she was ready.

Having already been nominated, she now knew what she was in for, and like a good HVAC installer – she was ready with a plan.

And this time?

She won.

She had a few thoughts prepared but no script, and according to her she "killed it".

I was there.

→ She killed it.

Rachelle confidently strode to the stage, winged (wung?) her speech, crushed it, and cemented her place atop the industry as a leading installer. And she did it as she does all things – with grace and modesty.

The humble, indeed, was exalted.

**The plans of the diligent
lead surely to abundance
Proverbs 21:5**

Rachelle's path from social worker in Hanson to red carpet hvac luminary is a ride.

Pillars of ambition, talent, the desire to learn, personal principles – they form a foundation that's allowed her to fearlessly chase her goals and live a life.

Right now, Rachelle is furthering her education en route to her own personal licensure. Owning her own business is a thought that flickers in the back of her mind.

Working for oneself presents a litany of challenges different from being a cog in one of the largest firms in the state.

Whatever the path that lies ahead – Rachelle's attitude, humility, skills, and passion will light the road, and she will find her way.

"what makes this trade so fascinating
is that there is always
something to learn"

Franjo Šestak

41 ♦ Weissenburg, GE

years in the trade

25

favorite brands

rothenburger ♦ wolf ♦

centrotherm

hobbies

renovating old houses ♦

soccer ♦ beer



@fat_sestak



To: _____



international

"every challenge provides
an opportunity
for personal growth"



Chris Pohl

35 ♦ Belgium, WI

years in the trade

12

favorite brands

hvac tactical ♦ navac

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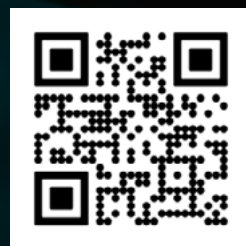
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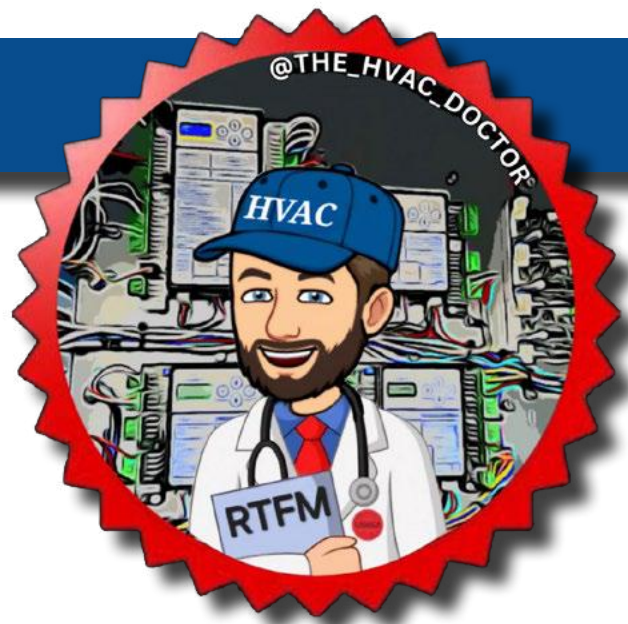
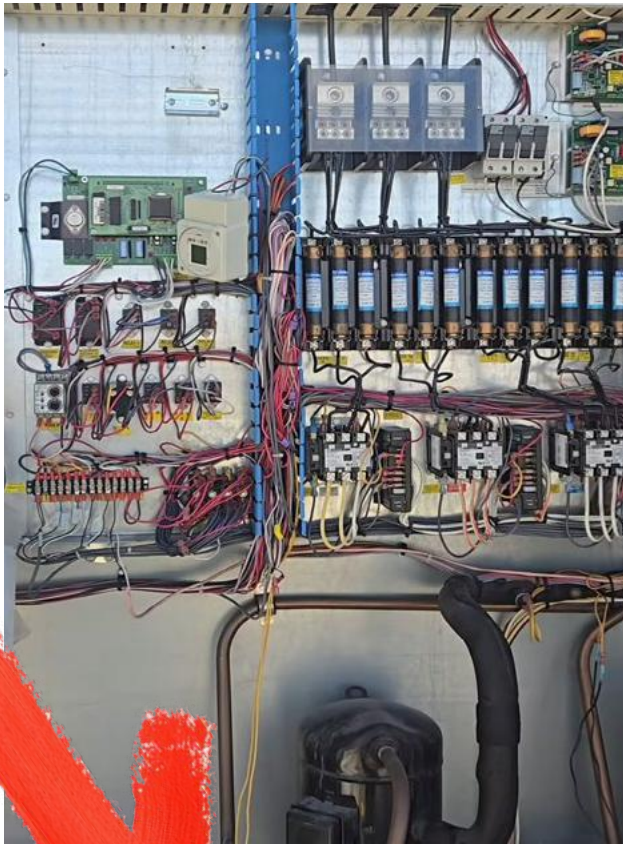


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submitted by matt waxer // @the_hvac_doctor

Toronto, ON

a note from the doc:

If you have an Aaon air handler that has failed or obsolete controls, the Aaon Xtend team can put together a controls upgrade package to bring the piece of equipment up to current Aaon controls standards and prolong the lifespan of the equipment.

The pictures shows an Aaon rtu that had a failed modgas control board and was controlled via a terminal strip enable from failed JCI Metasys controls.

The after picture shows an upgrade to current Aaon controls that includes the installation of a VCCX-IP main controller, two refrigerant control modules, and one modgas-x module.

With every Aaon Xtend upgrade the hvac doctor completes, he will ensure that the upgrade looks as good, if not better, than a factory installation.



THE EH-TEAM ELEVATE YOUR TRADE



JUST EXACTLY WHO IS THE HVAC DOCTOR?

Well, I am a red seal refrigeration and air conditioning systems mechanic, a G1 commercial/industrial gas fitter, a lifetime learner that holds a Ph.D in psychology, a mentor, a husband, a father, and a proud member of the **EH-TEAM**. Being a member of the **EH-TEAM** I strive to embody the slogan to “**ELEVATE YOUR TRADE**”. This is accomplished in many ways, for example from continually educating myself about changes and advancements in technology in the HVAC industry, to educating individuals about the HVAC industry through various social media videos and live hands on demonstrations at various trade shows. As an **EH-TEAM** member I also strive to inspire the next generation of potential skilled trades workers as well. One of the great aspects of being a part of the **EH-TEAM** is being part of a group of skilled trades workers that collectively embody the mindset of community over competition. Each member of the **EH-TEAM** is there to help each other out. Being a member of the **EH-TEAM** from the inception of the group, it has also been incredible to see the number of members and honorary members grow through out the years. We are always looking to welcome individuals that embody the mindset of elevating their trade to our team. Myself and many other members of the **EH-TEAM** are looking forward to connecting at upcoming trade shows—especially CMPX 2026 in Toronto. We’re excited to share that the **EH-TEAM** will be right at the center of the action, holding it down at the CMPX Social Hub. Come by and join us!

- Matt Waxer @the_hvac_doctor



See the full team at infraAIR.ca/EH-TEAM

Follow us on our new Instagram @ehteamcanada

when the machine answers

what AI CSRs are quietly changing in the industry

charlie felker

In the world of HVAC, the call is everything.

It's the first moment of trust. It's when confusion becomes clarity—or not. Whether you're a solo contractor on the jobsite or a commercial operation managing data center environments, how your business handles that moment says everything about who you are.

Now, artificial intelligence is stepping into that space—not as a gimmick, not as a chatbot, but as a voice. A voice that sounds human, thinks in real time, and follows logic you define. It books jobs, transfers calls, answers tough questions, and doesn't forget a thing.

But the real story isn't about what the AI does. It's about what it frees up, what it

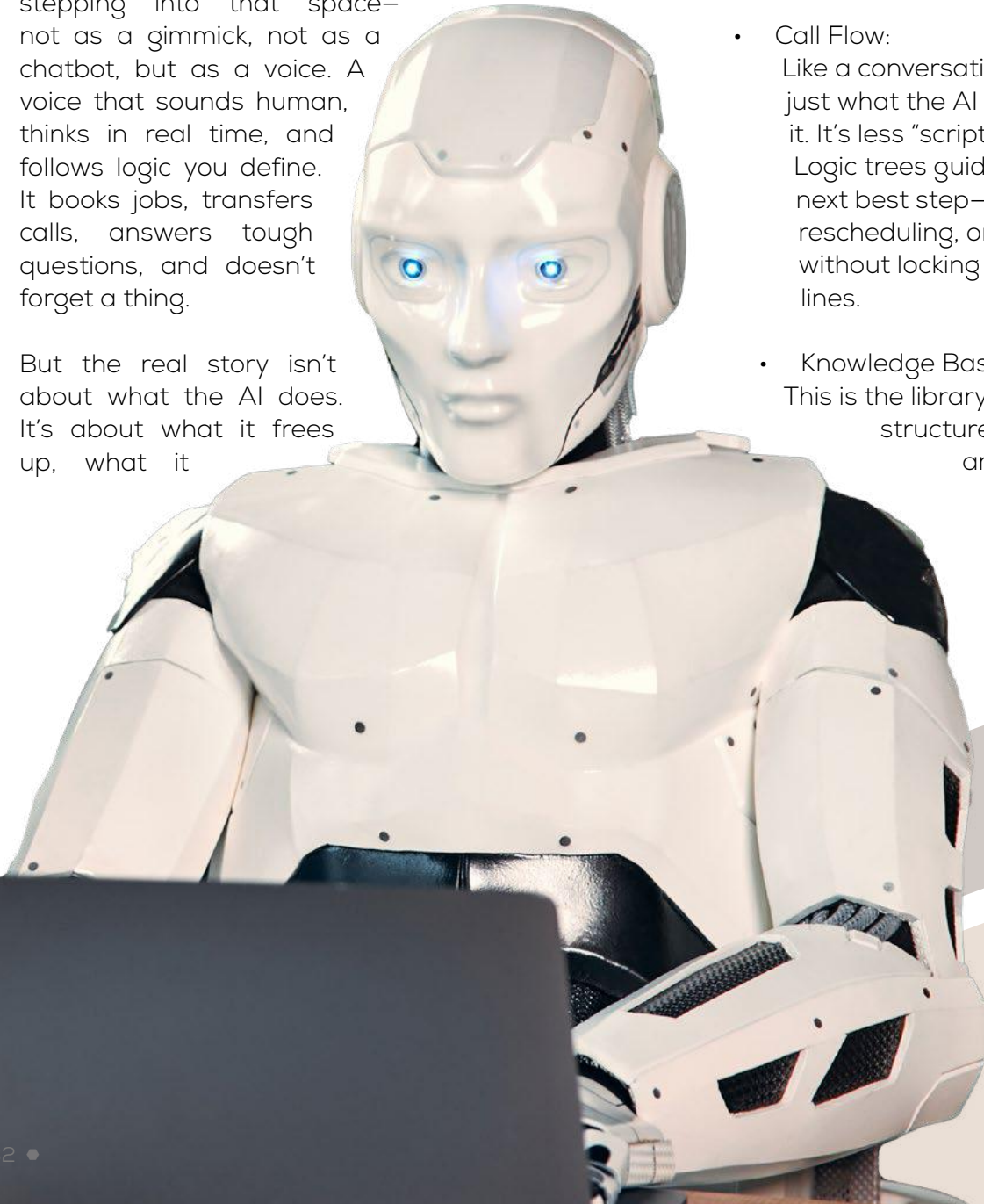
reveals, and what it quietly reshapes behind the scenes.

The Three-Layer Brain of an AI CSR

At the core of these systems are three interlocking structures: the call flow, the knowledge base, and the behavioral controls. Together, they form something both programmable and fluid—a system that can be

shaped with human intent but still think on its feet.

- **Call Flow:**
Like a conversation map, this defines not just what the AI says, but why it says it. It's less "script" and more "strategy." Logic trees guide the customer to the next best step—whether that's booking, rescheduling, or connecting with a tech—without locking the experience into rigid lines.
- **Knowledge Base:**
This is the library. Every service, policy, price structure, location-specific quirk, and piece of company intel lives here. Unlike a human rep who has to memorize or search for information, the AI draws from this instantly—every time.
- **Behavior Panel:**
The nuance tool. It fine-tunes how the AI speaks, responds, escalates, or even expresses tone. It ensures consistency, yes—but more importantly, it gives leadership control over how the company sounds, in every interaction.



It's Not Just Delegation. It's Cultural Engineering.

For the small shop,

AI voice systems often start as a lifesaver—handling calls when the owner's on a ladder. But over time, it becomes something deeper: a reflection of how the business thinks, serves, and evolves. It turns reactive chaos into structured intelligence.

For larger firms with call centers or multiple CSRs, AI isn't replacing people—it's augmenting the system. It removes bottlenecks.

It maintains precision during training gaps or high-volume spikes. It keeps standards tight even when teams are stretched thin.

And for commercial contractors dealing with high-stakes systems, think hospitals, clean rooms, or multi-million-dollar data centers, voice AI ensures no margin for miscommunication. It delivers clarity and control at a scale where human error costs more than just a callback.

The Hidden Impact: Thinking Differently About Time, Voice, and Trust

Here's what doesn't get talked about: when AI handles the call, the company leader starts thinking differently.

They start noticing how much time was spent explaining the same three things. They rethink how their business "sounds" to the outside world. They

start designing intentional experiences, not just hoping for good phone etiquette.

And when done well, it doesn't sound like AI at all. It sounds like the company at its best—every time.

That's the true power. Not automation, but representation. Not just delegation, but redefinition.

Why This Matters Now

As skilled labor gets harder to find, customer patience gets shorter, and systems get more complex, we're entering an era where communication is the real differentiator. Not price. Not even speed. But clarity, consistency, and care—from first contact to final invoice.

AI voice CSRs are quietly reshaping that landscape. Not because they replace people, but because they let people do more of what only humans can do: solve problems, build trust, lead teams, grow businesses.

Whether you're a one-person operation or managing thirty trucks, the question isn't "Should I use AI?" It's "What happens to my business when every customer interaction becomes a controlled, data-informed, never-forgotten moment?"

We don't have the full answer yet.

But the conversation has started.

And it's being answered—one call at a time.

Charlie Felker

Charlie Felker is the CEO and Co-Founder of Free2Grow. Prior to Free2Grow, he owned/operated a multi-state home service business which he successfully sold in 2019.

Charlie is a West Point graduate who served in the US Army from 2006-11 (82nd Airborne Division, 3rd Ranger Battalion).

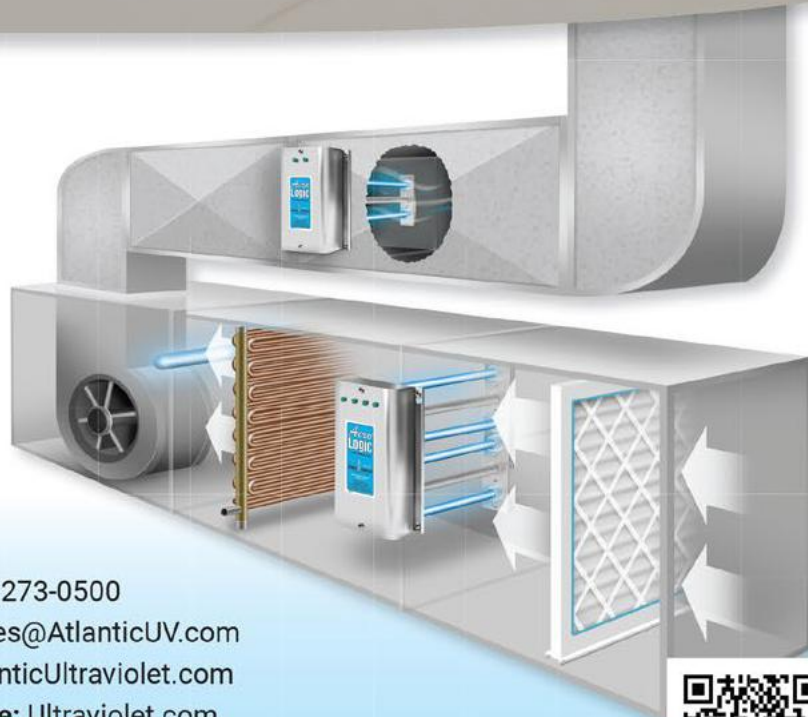


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¹ VS. standard electric. Source: AHRI directory of 10/23/24

² VS. comparable water heaters without mixing valve at 120°F set and 58°F water temperature

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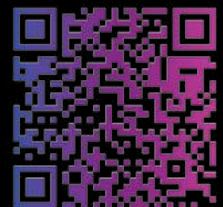
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boundaries

matt showers

Imagine this scenario: it's a late Friday afternoon during winter, and you just finished replacing a leaking indoor coil on a customer's geothermal heat pump.

You go to fire it up and find that the water valve is not opening properly, so the system shuts off due to a lack of water flow. The job for the coil was quoted at a set price, and this homeowner has been without heat from the system for the past couple weeks, getting by with some other heaters. He asks (almost begs) if you could stay longer to get the valve replaced, and you do keep one in stock on your truck. What would you do?

As trades professionals, we know all too well struggles like these that come along in our line of work. Most, if not all, of us know people that have had multiple divorces, personal struggles, and a host of other physical and mental issues associated with working in this industry.

For as rewarding as a career in the trades can be, it can have its own pitfalls. This is where setting and establishing boundaries can be vital—not only professionally, but especially personally.

Many of us know all too well how not setting boundaries affects us. We consistently work extra hours, which takes a toll on our sleep and meals. That affects our emotional well-being—and ultimately, the people closest to us. It creates a downward spiral and a vicious cycle.

For many of us, a simple boundary to place is knowing when to say “no” or “I can’t.” It’s certainly easier said than done, as we might get concerned with how setting that boundary could affect our employment and overall

standing with the boss and coworkers.

I can give some examples from my own experiences after being in this field for over ten years. I previously worked for a smaller residential and light commercial contractor for almost ten years. There were occasions throughout my time there where my wife was experiencing some form of burnout between being a stay-at-home mom and working part-time. She would periodically ask me to take a day off so she could recover. I felt guilty taking time off, especially during spring and fall, when so many of our residential customers wanted their respective maintenance done for the upcoming season. I also had a handful of “regulars” that requested me specifically.

I knew taking time away would throw off the schedule with the office and possibly the homeowners, and that was where my priority went. While this seemed good for my employer, it was not good for my family or marriage. I had to eventually learn to set a boundary in place. What really tipped the scale was my wife wisely asking: “You realize your coworkers aren’t going to be the ones at your funeral, right?” This ultimately caused me to realize that work is not, and should not, be a top priority.

In a way, my previous employer felt this sting themselves. The company had been family owned for over 50 years until they were acquired by a larger local corporation.

And while the family continued to operate the business for a time, the founder and father passed away shortly before the rest of them ‘retired’. The corporate newsletter following his death said absolutely nothing about his passing. This upset members of the family. While they were no longer owners of the company, it still bore the family

name! This shows just how quickly people are willing to move on; we are not indispensable.

Boundaries are necessary in life, whether they're physical, mental, emotional, etc. No one likes people wandering unexpectedly through their yard or property. Along those lines, we need to have similar boundaries at work.

Given the industry's current labor shortage, we have more leverage to set boundaries—especially when we're bringing the kind of value we should. Employers should also respect when their employees set boundaries, not retaliating through guilt, punishment, or by making it harder for them next time. This happened when I finally started asking for time off.

It wasn't anything major—but I'd hear things like, "It'd be nice to have more warning," or notice the sighs and subtle moaning that made me feel guilty for wanting to care for my family. Where I work now, I have the freedom to say "no" if I'm not comfortable taking a call—whether it's because I don't feel well-versed on an issue or just don't want to volunteer for after-hours work. I'm still able to decline without fear or worry.

A quick way to start setting boundaries for yourself is to simply not change plans you've made in advance when getting new work requests. Treat those plans as nonnegotiable!

I recently heard Bryan Orr say on an HVAC School podcast that when we work long hours, our loved ones are making a sacrifice for us. And when we're not working, we should be making sacrifices for them.

That might mean finally tackling a project that's been sitting for a while—or just spending real, quality time together. At the end of the day, it's about remembering what, and who, matters most.

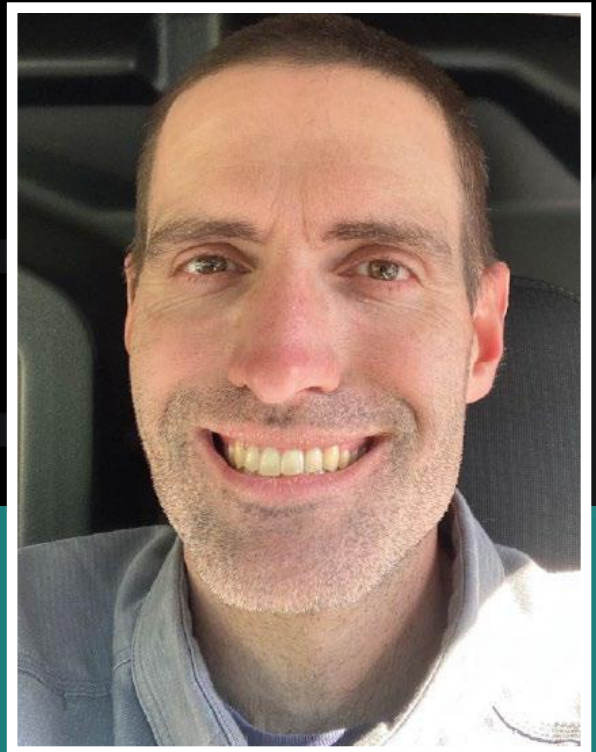
That scenario I opened with actually happened to me a few years ago. I told the customer I had completed the work within the scope of the quote and that we'd need to schedule another visit to replace the faulty valve. Turns out, setting that boundary protected both me and my employer. Even after making the decision, I checked in with a fellow HVAC friend to make sure I hadn't missed anything. He confirmed I'd made the right decision.

Having a small network of professionals outside your workplace helps reinforce those boundaries when you start second-guessing yourself. Setting boundaries isn't always easy at first, but it does get easier as your confidence grows.

About the Author

Matt Showers is a commercial service tech for an equipment manufacturer and the host of the Trade Therapy podcast, which highlights mental health stories of tradespeople.

Follow him on IG: @hvac_grammarian



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SLS387825	3/8 LL, 7/8 SL X 25' W/Insulation
SLS387835	3/8 LL, 7/8 SL X 35' W/Insulation
SLS387850	3/8 LL, 7/8 SL X 50' W/Insulation
SLS143815	1/4 LL, 3/8 SL X 15' W/Insulation Both Lines
SLS143825	1/4 LL, 3/8 SL X 25' W/Insulation Both Lines
SLS143850	1/4 LL, 3/8 SL X 50' W/Insulation Both Lines
SLS141215	1/4 LL, 1/2 SL X 15' W/Insulation Both Lines

PART NO.	DESCRIPTION
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SLS141250	1/4 LL, 1/2 SL X 50' W/Insulation Both Lines
SLS385825	3/8 LL, 5/8 SL X 25' W/Insulation
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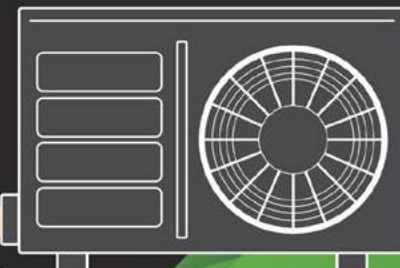
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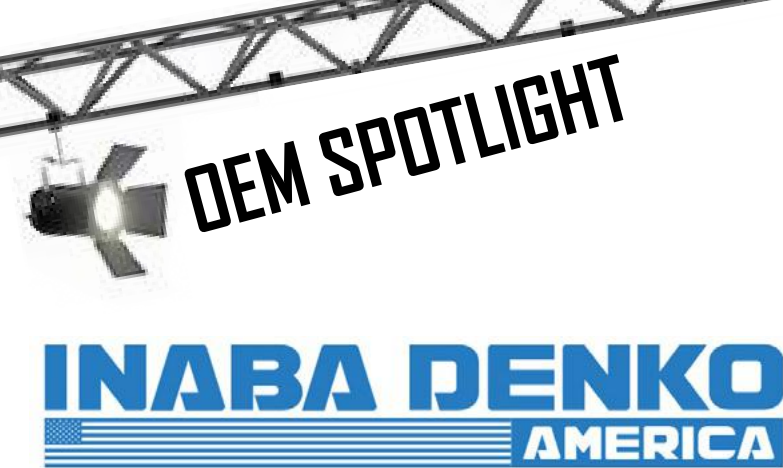
When we step back to view the bigger picture, the impact of outdated practices in the HVAC industry becomes clear. With approximately 450,000 HVAC service technicians in the U.S., together we could save over **3.5 million gallons** of vacuum pump oil and reduce over **50,000 tons** of CO₂ emissions a year.



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What is Inaba Denko America?

Inaba Denko America is the North American subsidiary of a premium, Japan-based manufacturer of ductless HVAC accessories, ranging from linesets, lineset covers, drain hoses, mounting systems, and more. Nonetheless, most of their product line is also compatible with unitary HVAC systems.

A product of Japanese ingenuity, the whole-home ductless air conditioner was invented in Japan in the mid-1900s to accommodate small homes with limited space and resources for ductwork.

Alongside this innovation of the minisplit, the founders of Osaka-based Inaba Denki Sangyo created its HVAC division, Inaba Denko, in the 1970s, beginning with the success of their drain hose kits and the Paircoil™ copper tube lineset series.

Truly and not coincidentally, their products have been around since the beginning and have continuously innovated together with ductless technology. Inaba Denko expanded their operations in 2023, establishing Inaba Denko America in Torrance, CA, to focus on marketing and sales operations in the North American markets and to better serve distributors and contractors around the region.

More than just a manufacturer of ductless accessories, Inaba Denko seeks to understand the specific installation challenges of today's minisplits and create products to simplify the jobs of technicians working the installs.

What brought Karina Aharonian into the HVAC industry and what does she find most interesting about it?

Marketing and Product Manager Karina Aharonian

a few minutes with **Karina Aharonian** **lianna schwalenberg**

joined Inaba Denko America in 2020 to develop and execute a marketing strategy from the ground up for the company's growth objectives. Prior to this position, Aharonian worked for a manufacturer of high-pressure fogging systems.

When asked what she finds most interesting about the HVAC industry, Aharonian delightfully responds that there's never a dull moment at her job. "Being able to build connections and friendships with installers, distributors, and wholesalers has been very rewarding," she says.

Specifically in HVAC, she praises the remarkably positive and supportive environment—observing, "It is so uplifting to see contractors helping each other, and allowing manufacturers like us to engage, get feedback, and find bottlenecks in the field that our products can help. The sense of camaraderie and respect is really something I have not experienced in other industries."

What are some of Inaba Denko America's most popular products?

Inaba Denko America's product portfolio spans the entirety of the ductless installation process—from their award-winning Superlock™ pipe hangers to the line braces, to entire hose kits, bug stoppers, and even the putty and tape. But their most popular product is their Slimduct™ lineset covers, which are specifically tailored to different applications and can be configured with an extensive array of fittings, flexible elbows, and wall inlets.

Slimduct™ lineset covers not only add an elegant, hidden finish to the installation, but most importantly, they protect the lines from weather damage, vandalism, and pests. The most popular Inaba Denko product in the US is the Slimduct™ SD, the residential lineset cover system, made of UV-stabilized, flame-retardant PVC.

For VRF/VRV applications, Inaba Denko offers the Slimduct™ RD, a lineset enclosure system made of hot-dipped galvanized steel which provides better protection even in highly corrosive environments such as coastal areas, as well as supportive protection for

areas that receive heavy snowpack.

What is an example of how Inaba Denko responds to the ever-changing demands of the HVAC industry?

Anticipating the increased demand for A2L refrigerants, the industry must ensure all new installations use safe building materials. In the North American markets, an important standard test which linesets must pass to be A2L compatible is the ASTM E84, specifically the 25/50 rating which looks at the flame-spread and smoke-development properties of insulation for mechanical systems, such as pipes, which passes through a plenum. Prioritizing safety amidst new demand,

Inaba Denko underwent extensive testing to ensure Paircoil™, which is their pre-paired and pre-insulated copper linesets, meets nine ASTM standards, including the ASTM E84 (25/50).

What are some examples of how Inaba Denko supports the HVAC community and those interested in HVAC?

When it comes to supporting the HVAC community, Inaba Denko maintains very close relationships with contractors, distributors, and technical schools to not only educate but to also learn from the people on the ground.

While she has a whole marketing department to run, Aharonian reveals, "What I really love about my job is being able to visit jobsites to connect with and learn from the installers in the field." She elaborates that this feedback from technicians and installers provides an invaluable look inside the industry.

"Inaba Denko genuinely loves raw, honest opinions," she reassures, and this can be seen in how frequently the Inaba Denko America team visits jobsites, attends trade shows, gives presentations, and donates samples to local technical schools. Regarding any questions or comments, they can easily be reached by social media, their website, or simply calling the office for support.

Furthermore, their "Ask the Trainer" series, along with their entire YouTube channel library, is available to all who are interested in learning how the products work or hearing successful case studies from contractors

across the country.

What piece of advice would Karina Aharonian give to an HVAC community member interested in becoming a manufacturing marketer?

For anyone in the industry interested in manufacturing marketing as a career, Aharonian maintains that being part of the HVAC community already puts you at an advantage.

She suggests, "Find which products or segment interests you. Read about the specific manufacturer, engage with their team, and visit their booths at trade shows. Manufacturers are always looking for reliable team members with field knowledge. I am open to talk to anyone interested in making the move to marketing. Inaba Denko America is growing, and we have opportunities available."

On reflection of her own experience, for anyone interested in learning the necessary skills, she advises, "You can't sell or promote something you don't know."



Karina Aharonian



Ductless applications were something very new to me.

Thankfully there are a lot of resources out there, ranging from HVAC magazines to installation courses provided by distributors and OEMs."

She continues that reading, staying up to date with the latest trends and regulations, watching videos, joining training sessions, combined with visiting the job sites were great activities that really helped her round out her knowledge. Her final piece of advice, "Trade shows are also a must—don't minimize what you can learn during a simple conversation at the show floor."

How can technicians get introduced to Inaba Denko America?

Aharonian recommends the best way to get started with Inaba Denko is to try their claim-to-fame and most popular product, the Slimduct™ SD Lineset Cover, the endlessly configurable solution to residential applications, available in four colors—white, ivory, brown, and black—to match any color scheme.

For a low stakes entry into Inaba Denko, another option worth considering is the Standard Drain Hose.

Engineered to prevent sweating, even in extreme conditions, this hose's multi-layer construction allows for easy bending and installation in tight or complex spaces as well as smooth, uninterrupted condensate flow.



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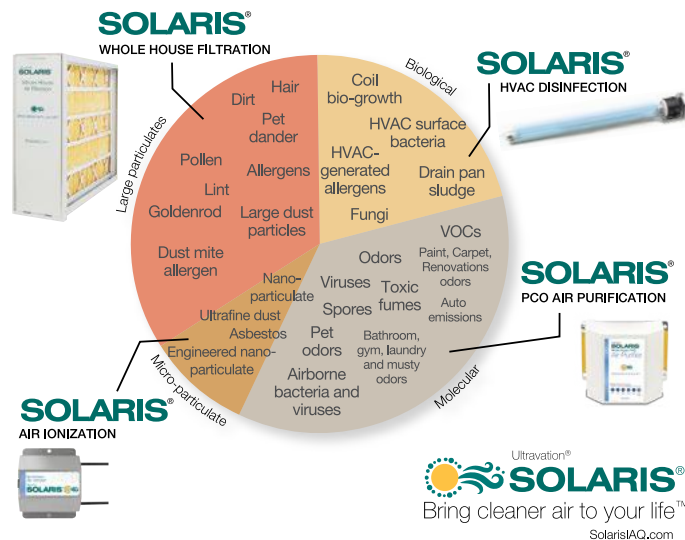
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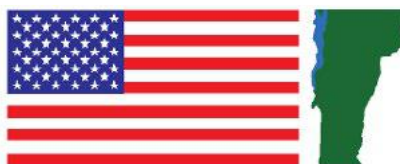
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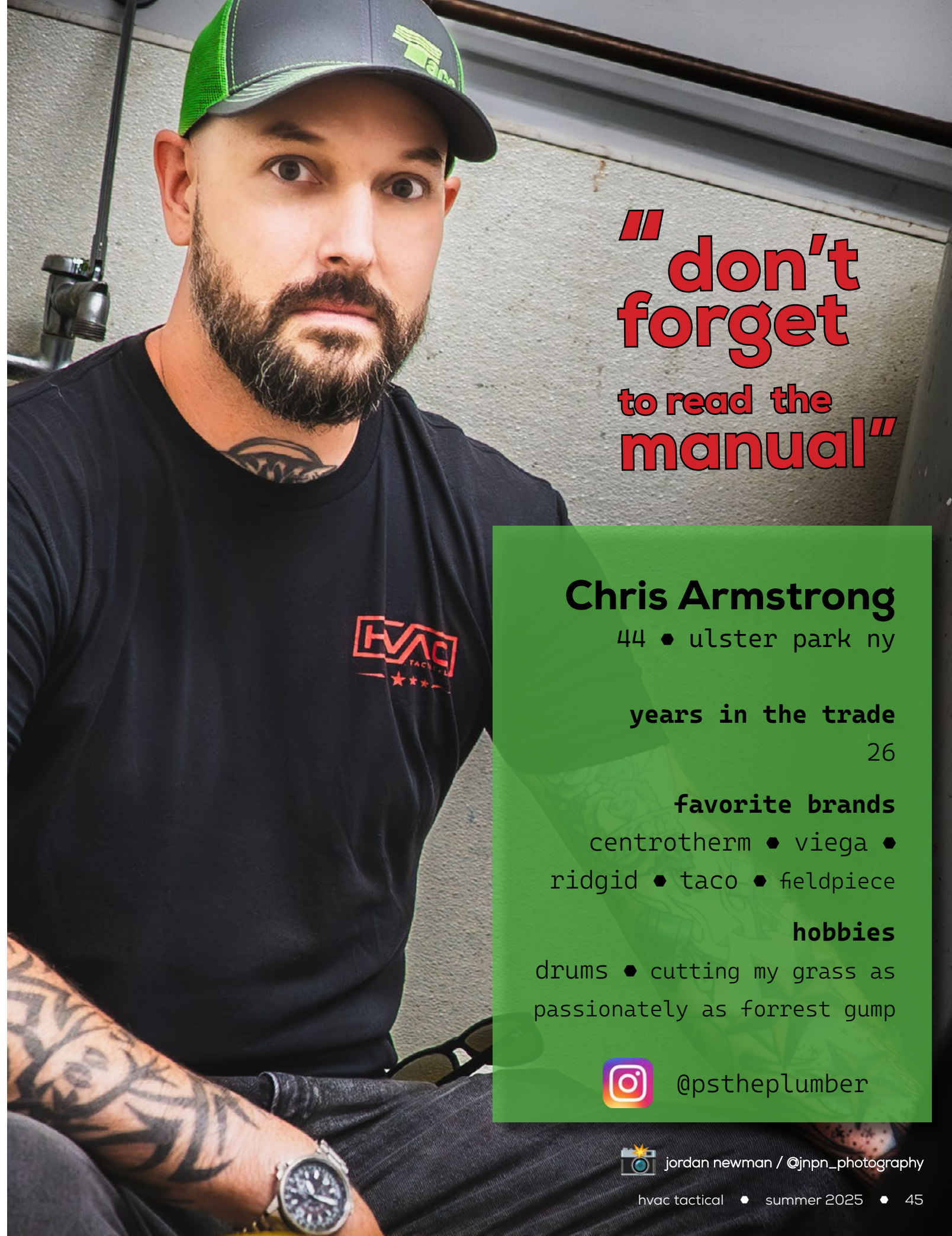


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Chris Armstrong

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thinking about getting into food service equipment repair?

> here's what you need to know about training

pat finley

@commercial_kitchen_chronicles



So, you're thinking about getting into foodservice repair, but you don't have any experience—and you're worried about training. I get it. That's a normal concern. This trade is packed with all kinds of equipment, controls, and unique processes.

The good news? There are way more training opportunities than you might think.

Transferable Skills: HVAC/R is the Gateway

To be upfront, I've yet to come across a dedicated trade school focused strictly on foodservice equipment repair.

Maybe one exists, but I haven't seen it. Nearly everything you'd learn in a traditional HVAC/R program transfers directly into this industry.

It all starts with the same foundation: tool usage, troubleshooting, and system diagnostics.

A gas valve is a gas valve. It takes voltage to open, whether in a furnace, oven, or fryer. Airflow principles are the same whether you're working on an air handler or a walk-in cooler: coils, heat exchange, refrigeration cycles—same concepts. System pressure is still converted to temperature, regardless of the unit.

So, if you have some HVAC knowledge—or are considering that route—you're already on the right track. Once you have that under your belt, it's time to see how it holds up on the job.

The Best Training? Real-World Experience

In my opinion, there's no better training than hands-on experience in the field. Working with

an experienced technician gives insight into not just the equipment but also the environment it's in—the layout, ventilation, customer behavior, and even the abuse the gear takes.

Classroom and lab learning are valuable, but you can't replicate what you'll encounter in the field.

When you start, most companies will pair you with a senior tech. Their job? To help you learn the ropes, diagnose and repair equipment safely and correctly, and show you how this trade works.

Your job is to pay attention, ask questions, and engage.

I've seen new techs take notes, record walkthroughs, and absorb everything. That's the right approach. What doesn't work is scrolling through your phone, checking out mentally, or waiting to be spoon-fed.

Training a new tech takes real effort. Senior techs must slow down, explain their process, and teach what each component does—and how to test it.

One of the best times to ask questions? In the van between calls. That's your chance to reflect on what just happened, how the issue was diagnosed, and how it was resolved—without a customer listening in.

That kind of mentorship is foundational—and some companies are building on it by offering more structured ways to support new techs from day one.

In-House Training Programs

Some companies go even further with structured in-house training. One standout example is Unlimited Service Group. They've developed a program called Training Unlimited™ with four

locations across the country. This 8-week paid program combines hands-on, in-field training, and classroom instruction to jumpstart a foodservice equipment repair, installation, and maintenance technician's career.

👉 **Learn more:** <https://unlimitedservice.com/training-unlimited>

Another great resource is CFESA—the Commercial Food Equipment Service Association, founded in 1963. CFESA is the only commercial food service association with a custom-designed training course for technicians in the industry. Over the past 26 years, they have grown their training program for entry-level, intermediate, and senior technicians.

CFESA sets the industry standard and offers a wide range of hands-on/classroom commercial food service repair and installation training opportunities, certifications, and events—not just for techs but the entire industry.



Even with helpful programs like these, the learning doesn't stop once you're out in the field. That foundation keeps growing, and staying sharp becomes part of the job.

Be Proactive—Take Ownership of Your Growth

Being out on your own doesn't mean the learning stops. In this trade, continuing education is part of the job. Whether it's refresher courses, manufacturer-specific sessions, or independent study, you'll need to stay current. Technology and controls are changing fast, and staying sharp is critical.

Manufacturers often offer free or low-cost training. Why?

Because you, the technician, represent their brand every time you fix a unit. The better you are, the better their product looks—and they know it. If you reach out, most brands will support technicians with resources, training, and tech support.

As a lead tech, I often build training around common problems I see on the job. It helps our team work smarter and stay ahead.

But here's the reality: your employer can't teach you everything. If you want to become a great tech—not just a decent one—you'll need to put in some extra work.

Fortunately, we live in the golden age of free training. YouTube channels like:

- ▶ HVACR Videos
- ▶ Advanced Refrigeration Podcast
- ▶ Commercial Kitchen Chronicles (shameless plug, I know 🙄)

...are all great starting points. Many manufacturers offer free training modules and even 1-on-1 support if you call or email their service teams.

Final Thoughts

It may seem like there's not much info out there, but that couldn't be further from the truth. The resources are out there—you must take the first step.

Look for a company willing to invest in your future.

Stay curious. Keep learning. This rewarding career has serious demand, good pay, and real growth opportunities.

Welcome to the foodservice repair industry.

Let's get to work.



beyond the credit score

what hvac contractors must know about the future of consumer financing

If You Think FICO Is Everything—Think Again.

Still betting everything on a customer's credit score to get financing approvals? You're betting against the house—playing yesterday's game with last decade's rules in a new environment. After processing hundreds of thousands of consumer applications annually and hearing the same frustrations from contractors and consumers alike, the data is clear: FICO is NOT KING.

It's just one voice in a crowded room of data points that lenders use to make decisions.

Credit Scores Are Just the Cover—Here's the Plot Twist

A FICO score is not a loan decision. It's a snapshot—a scoring model that weighs specific factors like payment history, credit utilization, and account mix. But that's all it is.

"They had a 720 score—why weren't they approved?"

Here's why: lenders today don't just rely on the credit score. They're digging deeper, asking better questions, and leveraging alternative data. They want a fuller picture of risk.

The Credit Balancing Act: What's Really Under the Hood

Modern consumer underwriting is more nuanced than ever. Let's break down what's really going on behind the scenes:

- **Debt-to-Income (DTI)**
Even with good credit, high debt relative to income is a red flag. Lenders want to see that a borrower can easily absorb the new payment alongside existing obligations.
- **Payment-to-Income (PTI)**

This ratio measures the monthly loan payment as a percentage of income—typically capped at 5–8%. If your customer's payment would push them above that limit, the approval odds drop.

- **Credit Utilization & Trade Line Mix**

One of the most misunderstood factors is how credit utilization (how much of available credit is being used) and the diversity of accounts affect decisions. Some lenders weigh installment loans (like auto or student loans) more favorably than revolving credit (credit cards), viewing them as structured and predictable.

While three credit cards might boost a score, a more balanced profile—with low utilization, one or two installment loans, and responsible revolving accounts—paints a picture of financial maturity. In fact, many lenders would prefer to see a borrower with a \$20,000 auto loan and two low-balance credit cards than five maxed-out cards and no installment history.

The Silent Killer of Approvals: When High Scores Hide Thin Files

It's the stealthiest denial in lending—a customer with a high FICO, yet still gets declined. Why? Because behind that shiny number is a thin file—maybe just one credit card and a short credit history. No car loans, no mortgage, no real track record.

To modern underwriting systems, that's risky. Lenders today want depth, not just digits. They look for consumers who've managed different types of credit over longer periods. It's not about perfection—it's about proven behavior.

While a 730 score looks great on their Credit Karma app, if there's no history to back it up, it could quietly sink the deal.

A sober reminder—FICO alone can't tell the full story.

Beyond the Score: The (Slightly Creepy) Data That's Deciding Who Gets Approved

Still think lenders only care about your credit score? Think again.

Today's underwriting models are peeking into some wild—and weirdly accurate—data to figure out who's creditworthy. It's not just about what you owe anymore... it's about how you live.

Where You Charge Your Phone

Yep, you read that right. If your phone gets plugged in at the same place night after night, that's a signal of housing stability. Mobile carriers ping your location, and lenders read that pattern like a bedtime story: "This person has a consistent home base—they're probably paying rent or a mortgage." It's eerie, but effective.

How Your Bank Account Behaves

Forget just checking your score. Today's lenders want to see how your checking account behaves. Are you getting paid regularly?

Keeping a cushion in your account? Spending responsibly? Even if your FICO isn't pretty, clean cash flow could tip the scale in your favor.

These behind-the-scenes insights are turning old-school credit models on their heads. Instead of tossing applicants based on one number, lenders now mix traditional scores with real-time behavioral data to make smarter—and fairer—decisions.

The new models aren't about underwriting as much as they are about understanding. For

contractors, that means more approvals, fewer surprises, and a better shot at closing the sale.

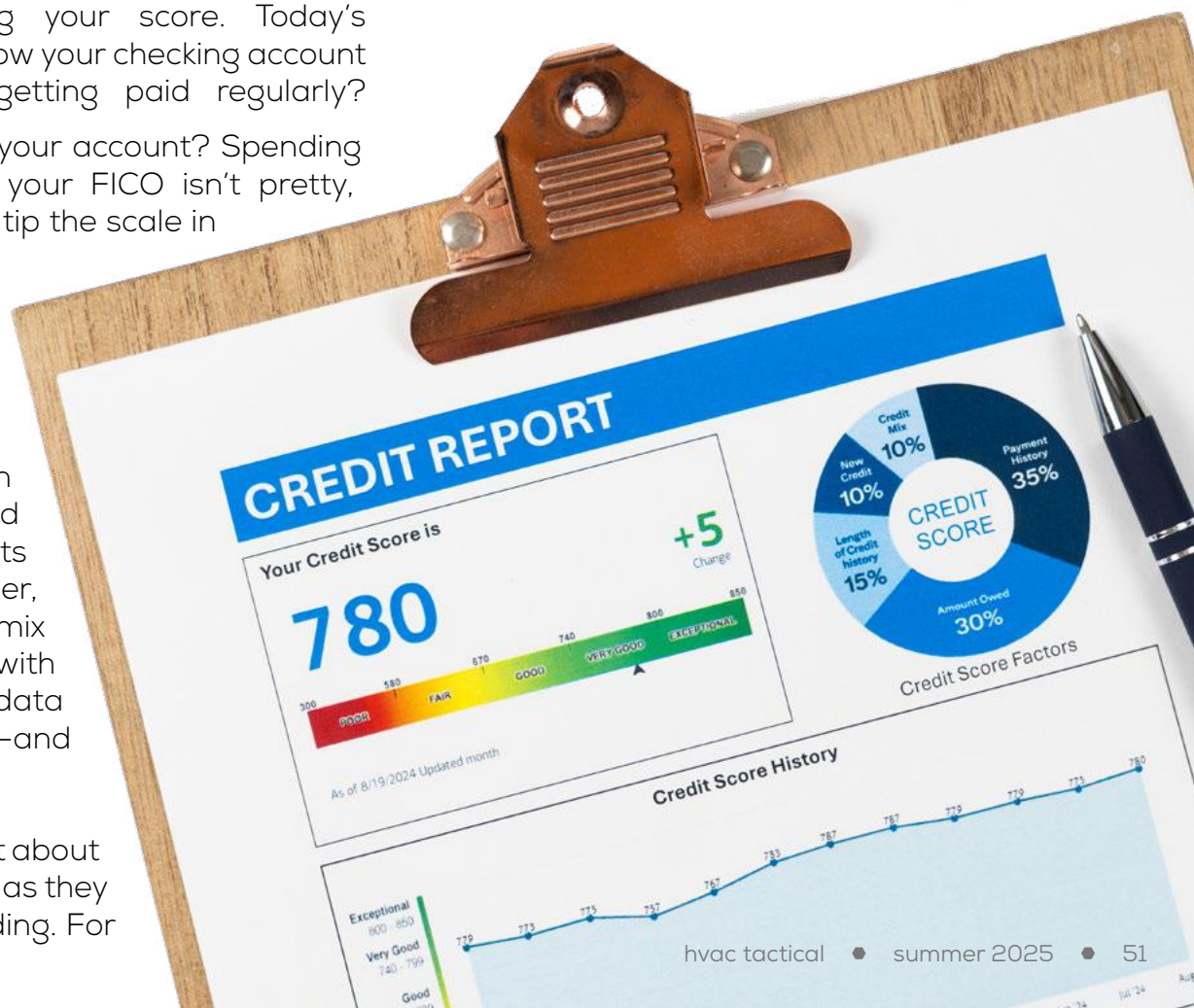
FICO Isn't the Law—It's Just a Number

For too long, FICO scores were treated like the final word in lending. Hit 680? You're in. Miss it by a point? Denied.

But modern lending doesn't work like that anymore—and thank goodness.

Traditional *bucket programs* relied on rigid cutoffs, ignoring real financial behavior. A 678 FICO with \$200K in the bank and spotless history? Still declined. That's not smart—that's outdated.

Risk-based pricing flips the script. It looks beyond



the score to consider income flow, account history, utilization, and more. It's flexible, dynamic, and actually makes sense.

For contractors, that shift unlocks three big wins:

- More approvals.
- Smarter rates
- Real-world context

This is what tips the scale. You're no longer crossing your fingers that a homeowner barely clears some arbitrary line. Now, you can lead the conversation and help them understand what really matters: it's not just about a number—it's about the story behind it.

Adopt that mindset, and you're not just selling HVAC systems—you're delivering real solutions.

And that's how you win.

Today's underwriting models are no longer black boxes. They're sophisticated engines pulling in more data than ever before. But with that complexity comes opportunity—especially for contractors who understand how they work.

The days of relying solely on a three-digit number are over. Now FICO is just the tip of the iceberg. The future of consumer financing is smarter, deeper, more dynamic—and contractors who understand this are ahead.

You don't need to be a lender. But you do need to speak the language of lending.

When you can guide a homeowner through the financing conversation with clarity and confidence, you don't just install comfort in their home—you instill confidence in their choice to trust you.

This is the new era.

The more you know, the better you close.



Jacob Reeves / ceo, Magwitch

Jacob Reeves is the acting CEO of Magwitch, where he's making home improvement financing smarter, faster, and easier for contractors and lenders alike. If it builds equity—whether in homes or in markets—he's in. With a mind and passion for tech, he's leading the charge to bring embedded lending into the modern era adding value to blueprints and balance sheets.

before ♦ after

Red Deer AB

This recent project brings together the cutting edge technology of the **Centrotherm** flue gas system and the **Navien** combi-boiler.

With meticulous attention to detail, every pipe, panel, and component has been carefully placed, creating a system that's not only built to perform, **but also to last.**



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bonus pic of ty // @icemaster_ty



Shakin' up the Circuit

Jennifer Manzo

@hvachicksjennifer

Misfits of HVAC Podcast

INSIDE the HVAC/r PODCAST CIRCUIT

forever, both hosts growing old on the screen just adding to the hilarity.

Unfortunately, that dream came to a screeching halt, and it was time to figure out a new direction for my life as a podcaster.

Meanwhile, the HVA-Chicks Coalition (which provides free training, 24/7 tech support, one-on-one mentor matches, book club, resources for women and youth entering the trades, free tools, and a massive community of helping hands to all techs in the USA and Canada) was growing so rapidly that I blinked and there were 2,000 people willingly helping each other and volunteering.

Manufacturers were donating their knowledge and time to make sure no tech has to be thrown to the wolves in 2025. While evaluating the growth and change in myself and my coalition, an idea occurred to me:

It's not often the HVACR podcast scene gets a new show...

...But when it does, you can pretty much guess how the theme will go: Interview a guest that three other podcasts had on this week about the same products we always see and repeat forever.

This layout has worked for years and brought some much-needed knowledge to our industry. This time, the newest podcast on the scene has found a way to bring some serious razzle dazzle to the monotony of everyday life in the HVAC industry!

A few months ago, I was blindsided by the ending of my podcast, The Misfits of HVAC. For 2 years I had poured my heart and soul into a show that I truly thought would last



What if we started a brand new kind of show? One where every voice could be heard—not just dedicated hosts and manufacturers, but where everyday techs could host any kind of episode their heart desires and every idea is valued.

What if we brought back the old but beloved structure of the “Saturday morning radio show” of decades past and spun it into 2025 with the opportunities and technology of today?

Thus, the HVA-Chicks Radio Show was born!

Every Saturday night at 9pm EST, random members of the HVA-Chicks Coalition sit down for an off-the-walls conversation about truly interesting and inspiring topics.

Each week the show changes based on the members who are hosting and the insanely relatable themes they choose. We switch it up between those interviews we all know and love, hilarious call-in episodes (our most recent entitled Funniest Service Calls was my personal favorite call-in), introductions to truly innovative products that haven’t yet hit the wider market, technical conversations with real

technicians and deeper conversations about the struggles we all face in the field and at home—and yes, even within our own minds as providers within the most complex trade of them all.

So often technicians feel like islands in the open ocean when it comes to the “real world”, constantly abandoning the desperate cries of boredom and replacing them with duty. I knew creating a show that is truly the first of its kind was an opportunity to change that wiring—if only for one hour a week.



So in from the ashes of one world ending, flew a brand-new start—not only for me, but for an industry rooted in progression and advancement.

Mirroring that sentiment is the HVA-Chicks Radio Show.

Run solely by coalition volunteers who donate their time and talent to editing,

recording, and hosting a hilariously fun place where techs of all ages and skill levels are celebrated for exactly who they are.

Where our community thrives, imaginations soar, and entertainment gets back to its roots—injecting dopamine

and serotonin into the overworked, overthinking brains of the next generation of HVACR.

Join us on our YouTube channel (@HVACHICKSCOFFICIAL) live Saturday nights, or listen on Spotify (HVA-Chicks Radio Show) on your way to your eighth service call at 4pm the following Friday.

We all know the system stopped cooling Tuesday anyway—no rush! We'll See you there, on the HVA-Chicks Radio Show!



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**"be better than yesterday
not better than others"**

Rizo Azizovich

29 ♦ Tashkent, UZ

years in the trade

9

favorite brands

milwaukee ♦ carrier ♦

danfoss ♦ dewalt ♦ ram trx

hobbies

self-care ♦ development

 @rizoazizovich_



Card



To: _____



international

superheat and subcooling: a technician's seasonal refresher

After six months away from the cooling season, technicians might find their refrigeration cycle muscles a little cramped.

This article is for intermediate technicians needing a re-hashing of the definitions and purposes of superheat and subcooling in straight-cool split applications. I will also briefly review how the principles of superheat and subcooling relate to other terms we commonly hear in cooling season, such as CTOA, approach, and design temperature difference.

After re-familiarizing yourselves with superheat and subcooling, I recommend reviewing Table 2, in which I outline some explanations as to why superheat or subcooling are remarkably high or low.

What is Saturation?

Superheat and subcooling are always spoken in relation to a concept from physics known as saturation, whereby a mixture in a closed system exists simultaneously as liquid and vapor because it is going through a change of state, such as boiling or condensing. Saturation typically occurs in the middle of the condenser and in the middle of the evaporator. Saturation happens at specific pressures and temperatures of a given refrigerant, which is why the pressure-temperature (PT) chart is essential for field diagnostics.

It's worth noting that some refrigerants are blends, and these blends can have what's known as "glide"—where saturation doesn't occur at a single temperature, but across a range. The "bubble point" is the lower temperature, and the "dew point" is the upper temperature. When calculating subcooling, technicians should use the bubble point, and when calculating superheat, technicians should use the dew point.

Design Temperature Difference (DTD) and Condensing Temperature Over Ambient (CTOA)

The industry's obsession over saturation continues with terms you'll hear in cooling season all the time, such as "the 35-degree rule" and "30 over ambient."

Design temperature difference (DTD) is the difference in temperature of air entering the condenser or the evaporator and the saturation temperature.

For example, in comfort cooling, if the evaporator's DTD is 35°F, then the middle of the evaporator (its saturation temperature) should be 40°F. This assumes a return air temperature of 75°F. More efficient air conditioners that operate at around 350 CFM per ton can have a higher DTD—so the coil might reach as low as 35°F even with 75°F return air.

The condenser's DTD—also called condensing temperature over ambient (CTOA)—estimates how many degrees above the outdoor air or water-in temperature the refrigerant will condense, depending on the type of system. Table 1 demonstrates how CTOA and SEER correspond. For example, with a 17 SEER system, we can fully de-superheat, condense, and sub-cool the refrigerant at temperatures as close as 15°F above ambient. Design strategies in both coils and the fans have enabled newer equipment to not work so hard for the same if not better cooling effect.

The Role of The Metering Device in System Balance

As an intentional restriction in the refrigeration system, the metering device plays a vital role in superheat and subcooling, and there are several kinds. Capillary tubes and pistons are two styles of fixed orifice metering devices with no moving parts. On the other hand, thermostatic expansion valves (TXVs) and electronic expansion valves (EEVs) are two styles of metering device that regulate the flow of refrigerant into the evaporator coil.

Manufacture year of AC	SEER rating	Estimated CTOA	Target Subcooling	Approach (°F)
Older than 1991	≤ 9	30 °F (16.7 °C)	10°F	20
			11°F	19
			13°F	17
1992-2005	> 9 and ≤ 12	25 °F (13.9 °C)	10°F	15
			11°F	14
			13°F	12
2006-present	> 12 and ≤ 16	20 °F (11.1 °C)	10°F	10
			11°F	9
			13°F	7
2006-present	> 16	15 °F (8.3 °C)	10°F	5
			11°F	4
			13°F	2

Table 1. Determining Approach Values (Source: ACCA 310-2020, §8.4)

TXVs and EEVs were later inventions from the fixed orifice devices to improve efficiency by allowing the system to respond to changes in load conditions. Briefly, TXVs respond to three forces: the sensing bulb pressure (P1), the equalizer pressure (P2), which may be internal or external, and the spring pressure (P3), which is sometimes adjustable. P1 is the opening pressure, and P2 and P3 are the closing pressures. The goal of a throttling metering device is to ensure the coil is full of boiling refrigerant, but not so much that it could flood the compressor. So long as the opening and closing pressures are equal, the valve will stay open. This explains why, when the sensing bulb falls off the coil, the TXV will overfeed the evaporator coil as it believes the coil is warmer than it actually is.

What is superheat?

Superheat is an indicator of how full the evaporator is with boiling refrigerant and is expressed as how much the refrigerant has warmed up since it finished boiling inside the evaporator. The boiling point temperature is theoretically known from the PT chart after measuring the suction pressure. As long as the suction line temperature is warmer than its VSAT (the suction saturation temperature), we can predict the refrigerant has fully evaporated.

The evaporator runs most efficiently when full of refrigerant in the process of evaporating—making the superheat low. However, if the superheat is too low—a condition known as a “flooded” evaporator—

we risk slugging the compressor with liquid refrigerant.

Though a certain amount of superheat is necessary to protect the compressor, too much superheat is an indication that the evaporator is “starved.”

A common mistake when calculating superheat (and subcooling) is reversing the order of subtraction. For example, if the VSAT is 45°F and the suction line is 35°F, you don’t have 10° superheat—you’ve got 0° superheat, an indication of liquid in the suction line.

Target superheat is the recommended method to charge a system with a fixed orifice. Manufacturers typically provide a target superheat chart, though there’s also a formula. Both require the technician to know the indoor wet bulb and outdoor dry bulb temperatures. Superheat is a less reliable diagnostic in TXV systems, since the valve is designed to maintain a constant level.

What is subcooling?

Subcooling is an indicator of how much liquid is stacked inside the condenser and is measured by how much the refrigerant has cooled after it began condensing. The condensing temperature is theoretically known from the PT chart after measuring the liquid line pressure.

This means that as long as the liquid line temperature is cooler than its saturation temperature, we can predict the refrigerant is fully liquid. Too much subcooling



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BUILT
TOUGH**



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indicates the condenser is flooded. Too little subcooling means the condenser is starved.

On the high side of the compressor, the refrigerant's saturation temperature increases—as seen on the PT chart—which allows the system to condense vapor and reject heat from both the space and the compressor, even on extremely hot days.

When the ambient temperature is far below saturation, the refrigerant can condense too quickly, losing the pressure needed to push itself into the evaporator. Low ambient controls, such as cycling the condenser fan off, allow mechanical cooling on colder days by maintaining high head pressure.

Subcooling and Approach

One final vocab word that technicians might come across is approach. Approach is a non-invasive check on heat transfer efficiency and can be compared to manufacturer guidelines. In split systems, it's calculated by subtracting the outdoor ambient temperature from the liquid line temperature.

A high approach value may indicate the system is undercharged; a low value may indicate it's overcharged.

Because subcooling tells us how much the refrigerant has cooled since it began condensing, if the technician knows the estimated CTOA and target subcooling, they can approximate a target approach.

As shown in Table 1, expected approach values have decreased as air conditioners have become more efficient.

For chillers, approach is the temperature difference between refrigerant saturation and the leaving fluid temperature. For cooling towers, it's the difference between the leaving water temperature and the ambient wet bulb temperature. In all cases, approach tells us how well heat is being rejected into the system's heat rejection medium.

	SUPERHEAT SH = SUCTION LINE TEMP – SATURATION TEMP (PT CHART)	SUBCOOLING SC = SATURATION TEMP (PT CHART) – LIQUID LINE TEMP
HIGH	STARVED EVAPORATOR <ul style="list-style-type: none">▪ Low charge▪ Liquid line restriction▪ Metering device underfeeding▪ Gas entering the metering device▪ Excessive heat load	FLOODED CONDENSER <ul style="list-style-type: none">▪ Low ambient temperature▪ Over charge▪ Liquid line restriction▪ Metering device underfeeding
LOW	FLOODED EVAPORATOR <ul style="list-style-type: none">▪ Cold return air▪ Low evaporator airflow▪ Over charge▪ Metering device overfeeding▪ Oversized AC equipment	STARVED CONDENSER <ul style="list-style-type: none">▪ Low condenser air flow▪ High ambient temperature▪ Low charge▪ Metering device overfeeding▪ Reversing valve bypassing

Note: This list is not exhaustive, and possible causes are best confirmed after the technician has checked gauges and probes are calibrated and mounted in the correct locations, and the technician has taken delta temperature measurements, compressor amps, compression ratio if necessary, and considered the effects of all accessories in the system.

Table 2. Guidelines for Superheat and Subcooling (Source: Author)

Lianna Schwalenberg

Lianna Schwalenberg is a service technician for the K Company, a mechanical contractor with over 50 years experience pursuing excellence in design, installation, energy management, and service, for commercial, industrial, and residential HVAC/R settings, located in Akron, OH.

Lianna has a Bachelor of Arts from the University of Wisconsin-Madison, with a minor in Environmental Studies, and an Associate of Applied Science in HVAC Technology from Stark State College. She began working for the K Company in 2021 and has since received highly-specialized training to maintain and service dehumidification equipment for natatorium applications. She argues that people like herself who own fish or aquatic turtles intrinsically understand the dynamic relationship between water and air.



Community Over Competition // The Heartbeat of the Trades

From National Movement to Trade Show First

terence chan

@the__impetus

The foundation for what became the AHR 2025 Community Over Competition Build didn't start with one person – it started with a shared mindset.

Across the country, we connected with like-minded tradespeople – individuals known not just for their craft, but for their willingness to share, teach, and grow the industry. What started as a network of pros coming together evolved into something bigger: a national movement built on respect, collaboration, and a genuine love for the trades.

That's when the idea clicked: What if we created a live, hands-on experience at a tradeshow – not a competition, not a demo – but a collaborative build that invited the entire industry to engage?

It was something never done before. Outside of skills competitions, no one had attempted a fully interactive build at this level, especially not with the purpose of education, visibility, and unity.

That vision led to deeper conversations with NIBCO, who immediately saw the potential. They didn't just back it – they helped elevate it. As title sponsor, NIBCO, along with fellow platinum sponsors Navien and Grundfos, helped bring this concept to life on the world stage at AHR 2025 in Orlando, where it became a beacon for what the trades could be when community takes priority over competition.

The Community Over Competition Boiler Build

We didn't build a booth. We built a movement. For two full days, tradespeople from across North America came together on the show floor to build a live-functioning

hydronic heating system – not as competitors, but as collaborators. Each person brought their own style, their own knowledge, and their own story.

We called it the **"Community Over Competition"** Build, and it lived up to the name.

No egos. No gatekeeping. Just a group of pros building something real, in real time – all while showing the next generation that there's more than one path to success in the trades.

33 Million Views and Counting

The energy on the floor was unreal – but it didn't stop there.

Through curated content across platforms like Instagram, TikTok, YouTube, and LinkedIn, the build reached over 33 million views. That's not a typo – **33 million**.

This wasn't fluff.

It was educational, raw, and real. Viewers watched the entire build process: pressing fittings, wiring controls, setting up circulators – and more importantly, they watched tradespeople work together instead of competing.

Each sponsor and partner involved got genuine coverage – not forced plugs, but real engagement by creators who actually use the products on the job.

Sponsor Integration That Meant Something

Our sponsors didn't just get logos on banners – they became part of the experience. NIBCO, as our title sponsor, helped take this from concept to international stage. Navien brought innovation and efficiency to the heart of the system.

Grundfos ensured we had the muscle and



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Support



Advanced
After Hours



Dynamic Call
Transferring



AI Voice
Scheduling



Personalized
Scripting



Dedicated Custom
Onboarding



CRM
Integration

Client Testimonial



Free2Grow has become an important part of our team. They worked diligently to build and personalize an AI Voice tool that is booking calls into ServiceTitan. They have focused on what matters for us and have delivered.

- Charlene Logwood, Customer Service Manager

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intelligence behind the flow. Other partners contributed components, tools, and technical support.

All were featured in content, build moments, and shoutouts across our platforms.

Each brand became part of a bigger message: that collaboration, not competition, drives the future of our industry.

The Legacy: Giving Back

After the show, many of the components and equipment used in the build were donated to schools and training programs. This wasn't just lip service – we showed up and gave back.

We captured photos and videos of the gear being hand-delivered to schools, where it will now be used to train the next generation of HVAC and hydronic pros. For many of these programs, it was the first time they had access to this level of equipment.

This is what it means to invest in the future – not with talk, but with action.

What's Next?

AHR 2025 proved that when you bring real tradespeople together,

give them a platform, and let the cameras roll – magic happens. Not influencer fluff. Not brand noise. Just skill, collaboration, and purpose.

And this is just the beginning.

The community is growing, the momentum is building, and the mission is clearer than ever: Uplift the trades, empower the next generation, and prove that we're stronger when we build together. bring real tradespeople together, give them a platform, and let the cameras roll – magic happens. Not influencer fluff. Not brand noise. Just skill, collaboration, and purpose.

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Jamie Christensen

42 ♦ Lake Stevens, wa

years in the trade

23

favorite brands

mitsubishi

hobbies

fishing ♦ hiking ♦ baseball

In 2018, an idea was brought to life.

An idea that HVAC guys who were passionate about their craft could wear cool gear that represented what they did for a living.

An idea that the brand itself would stand for something more than just a cool looking shirt or hat.

That idea was HVAC Tactical.

It celebrates those who have the desire to learn and have made the conscious decision to strive to be the best at what they do.

Being tactical is a mindset.

It's seeing the end before you even begin.

Calculating, planning, and plotting every step to ensure the success of the team, job or goal.

So keep training, keep learning, and make the decision to be the best.

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**more than a brand
more than a lifestyle
› it's a mindset**



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