HVAC + D Basics & Beyond with Renee Nguyen Broussard

SPEAKERS
Kendra Seymour, Renee Nguyen Broussard

RNB
Renee Nguyen Broussard
00:00
Like your lungs, bring in fresh air and get rid of what your body doesn't need. Your HVAC system does the very same thing for your home, but if your lungs were full of dust or mold you'd have trouble breathing. So why would we want to have our home's lungs become that way?

KS
Kendra Seymour
00:26
Welcome to the HVAC plus D mini Class series brought to you by Change the Air Foundation. This series is made possible thanks to the generosity of our sponsor, Santa Fe Dehumidifiers. We are deeply grateful for their support, which helps us continue raising awareness and providing free resources so that more families can breathe safe indoor air. A quick reminder, this 12 part mini class series offers a consumer friendly overview of common HVAC plus D topics. It is not a replacement for professional advice. You can watch the full series on our YouTube channel or by visiting ChangetheAirFoundation.org, and clicking on our resources tab. Welcome to Episode One, HVAC plus D, Basics and Beyond, with Renee Broussard. This episode will explain the different parts of the HVAC system, what they do and how they work. This short and engaging session lays the foundation every homeowner and renter should have. A bit about Renee, she is the owner and CEO of Airelytics. Where she leads with deep passion for healthy homes and informed homeowners. Before founding Airelytics with her husband, Renee spent over a decade in healthcare, beginning as a staffing coordinator in home health and later becoming a licensed practical nurse. Her clinical experience spans mental health, dialysis and long term care. Renee's transition into building science was driven by personal experience. After discovering hidden mold in her home and witnessing the serious health effects it had on her newborn, she became determined to help other families avoid similar harm. Today, she holds multiple certifications from BPI, including quality control inspector, energy auditor,

building analyst professional and brings a rare combination of medical insight and building science expertise to her work. Through Airelytics Renee empowers homeowners with education and actionable root cause solutions to improve indoor environments and protect long term health. She lives in South Louisiana with her husband, Michael and their two beautiful daughters. Renee, thank you so much for being here. I really appreciate you taking time out of your schedule to join us today.

RNB
Renee Nguyen Broussard
02:26
Thank you so much for having me. It's an honor. I'm looking forward.

KS
Kendra Seymour
02:31
I think what I'm so excited about, I've seen your presentation, and for anyone listening, I was guilty of this. I was that homeowner who I didn't understand much about my HVAC system, other than the thermostat on the wall could make it blow hot or cold, and I knew to call an HVAC company if it stopped working. But that is where my knowledge started and where it ended. And really the HVAC system, it is the lungs of the home. It is so important, and it's an area that I think, because it's often out of sight, out of mind, doesn't get the attention it deserves. And it is one of those areas where, much like the inspection and remediation industry, it is like the Wild West. So it is important as a consumer, as a homeowner and renter, to be knowledgeable. So I'm so excited for you to kick us off. And if you're thinking, oh my gosh, this sounds so overwhelming. Renee is a superstar. She was a nurse, and as you heard in her bio on a previous career, and she is going to connect everything to the parts of your body, so you're going to understand, really, how the the HVAC system works in a really relatable way. So Renee, I cannot wait. Why don't you take it away?

RNB
Renee Nguyen Broussard
03:42
Thank you so much. I'm going to actually go over HVAC basics and beyond. Most folks think of HVAC as a very scary unknown, because there's so many moving parts, but when you realize how connected it is to our body in a similar way, it really helps understand your HVAC system. So when it comes to your HVAC plus D, most folks are like, what is that mean? Um, it basically means heating, ventilation, air conditioning, in the south, I like to think about the word dehumidification too. Um, HVAC is so important. It's like a body that breathes and it has to feel right, um, it's used like a body system for breathing, warming up, cooling down, staying healthy, most importantly. Your house needs to breathe clean air, just like you do. Without proper HVAC performance, your house would feel stuffy or sweaty, and that's not good for anyone. Just like HVAC plus D. It's like your lungs bring in fresh air and get rid of what your body doesn't need. Your HVAC system does the very same thing for your home, but if your lungs were full of dust or mold you'd have trouble breathing. So why would we want to have our homes lungs become that way? A good HVAC system

must control both temperature and humidity to keep people comfortable. Moisture control is all about protecting the building materials and keeping the home safe. When the home is out of balance, you're going to see the symptoms that can appear as biological pollutants, and that can range between bacteria, viruses and mold spores. Your HVAC system, it's just like your body organs working together. It's the same concept when it comes to your home. Don't worry if the parts of the HVAC system seems confusing right now, you're not alone. Think of it like your body itself. Every part has a job, and they all work together to keep you feeling just right. So let's break it down simple so you'll start to recognize what's what, and it'll finally make sense when you look at it.

RNB

Renee Nguyen Broussard

05:51

This is my favorite part. When I think of a thermostat or your wall controller, it's just like your brain. It decides if you're too hot or too cold, and then it tells the rest of the system what to do. Just like your brain tells your body to sweat or shiver. Why did the thermostat get promoted? Because it always knew how to keep its cool under pressure. And when to bring heat. So your outdoor condensing unit is very much like your sweat glands. Um, it releases heat from the body, or the same concept, it'll release heat from the house to the outside when it gets too warm. This component usually has three items inside of it. This includes your fan, your condenser coil and your compressor. Just like your body has important parts working together. These are what these three things are doing inside of the condensing unit. The fan is like a breeze. It blows air across the coils to help release heat. Your condenser coil is like your skin pores. It lets the heat escape, and it's like when it's exactly like your cool down system, helping remove the heat and pushing it out. Your compressor itself, I like to think of it, and most HVAC folks do too. They think of the compressor as the heart of the physical system, because it literally pumps the refrigerant, this magic cooling fluid around, just like your heart pumps the blood to the rest of your body.

RNB

Renee Nguyen Broussard

07:20

Your indoor unit that can include your furnace and coil and air handler. I would like for you to think of it as your lung muscles that moves air to your body, or your heart that helps moves blood to the rest of your body. This indoor unit moves air and keeps your body warm or cools you down. There is a disclaimer. I know the diagram that you see looks like, may look like your air handler, but I want to let you know it varies with the components depending on the type of system. So if your system's all electric, has a gas furnace or it's a heat pump, every design is just a little different, but these are examples of what you would typically see in a residential home. When it comes to your drain pan and your evaporator coils inside your air handler, it's exactly what it sounds like. Um, your home sweats to stay cool, just like you do when you're hot. Evaporator coils are very much like your skin. They cool the air just like how your skin cools down, cools you down when you sweat. Um, let's not forget about the fins. It is attached to the tubing to absorb

heat. They're like tiny little helpers connected to the coil tubes. They grab the extra heat from the air and help everything cool down even faster. This drain pan is like the part of your skin that holds all the sweat before it drips off. You really want that pan to catch all that water that forms when warm air meets the cold coil. Usually you'll see a PVC pipe, very similar to what you see on here. It's also known as in condensate line. I like to compare it to your body's bladder or your pee system, because it takes the extra water out and drains out of the body.

RNB
Renee Nguyen Broussard
09:14
When it comes to your blower fan that's found inside your air handler, sometimes you can also see a heat exchanger inside your air handler as well. The blower is very much like your lungs. When you're exhaling the air, the heat exchanges where the heat gets added back into the air. You'll usually find a filter in this area. Filters act like nose hairs. It catches your dust, the pollen and all the other junk in the home, basically from the air before it blows back into your home. We want to keep the air clean and the system healthy, and that's what filters do. The placement of the filter will vary, though.

RNB
Renee Nguyen Broussard
09:55
This is where we get to talk about your return ducts. Now, as the name suggests, it's returning old air. I like to compare it to like the veins in your body. Your veins will bring back old blood to your heart to get freshen up before your blood sends out new blood to the rest of your body. Your AC system acts the same way these return ducts receive all the old air. It's usually stuffy, dirty, funky, and it's returning it back into the system to be cleaned and refreshed, to go back into your home. When I think about the return air, I also think about your return plenum. It's usually right there. It's the receiving part. I like to consider this as the chambers of your heart. They hold and push air where it needs to go in the system. We've spoken about all the return aspects of old air being brought back into the air handler. I'm now going to talk about your supply side. This is where you'll find your supply plenum, again, acting like a chamber. It holds all the good air, um, and it will be sent back out to your condition spaces. So you'll see where the supply air exactly how it sounds. It supplies just like your arteries do for your body. Here's the fun part, ductwork, grilles and registers. I used to think these were all the same thing. They're not. These are exactly like the air. Highways and doorways. It's just like your nose, mouth and throat. They carry air in and out of every room like breath flows through your body. There are different types of ductwork and grilles, though. When it comes to the type of ductwork, there's usually four types. You've got your sheet metal ducts, your flexible ducts, fiber glass and fiber board. When I think of sheet metal ducts, I always call them hard ducts, because they're pretty firm. Here in the south, we usually come across a lot of flexible ducts, also known as soft ducts. When it comes to your grilles, there are typically louvered or perforated coverings for a duct opening. I typically call them supply grilles because they're what you see supplying into the rooms. The biggest grille

is also known as your return grille. In your home, you can typically find that where you replace the filter again. Every system varies, but your return grille can be found either on your ceiling, on your walls, or actually on a closet AC door. Registers are a little different from grilles where they have a combination of both a grille and a damper. Dampers get to control the airflow, supply to your condition space. When it comes to diffusers, these are also just a little bit different. They can be circular. This is an example of a square one. It can also be rectangular, and it's located in the ceiling while discharging your supply air to different directions and places. It's all in the design and as part of your HVAC system. When they involve that with your home.

RNB

Renee Nguyen Broussard

13:18

Most folks are like, what's a damper? Man, that's pretty a confusing one when I first came across HVAC. To me, I like to think of dampers and zones as a source of like a blood control. So if you're running, you want more flow to your body so that you can get more oxygen to the rest of your body. But if you're really, really cold, you actually slow down the blood flow in your body sometimes. Dampers are just like muscles and blood flow control that open and close. They help direct the air to the right body parts or rooms that need the most air. It's like flexing to move heat where it's cold, or cold air where it's warm. So that is all the parts of your HVAC system. The next big question is, how does heat and air conditioning actually works? It will vary, but each component predominantly works similar in some way or design. So when it comes to heating, it's like your house wants to put on a jacket and keep taking warm breaths to stay toasty, just like you do when you're cold outside, automatically, you think of your thermostat. Remember it's your brain. When you feel cold, your brain tells your body to warm up. And the thermostat, because it's the brain, it senses the chill and says, time to turn on the heat. Here comes your filter, where it comes with nose hairs, or acts like nose hairs. And before any air goes into the system, it passes through the filter, just like how your nose filters out dust when you breathe. And of course, air is going to go to your blower fan inside of your air handler, it acts like the lungs, where the blower fan will take in the air and then push the warm air out to every part of the body, just like your body breathing out warm air. So keep in mind that's going through the duct system and then coming out of your supply grilles. Once the air goes over the blower fan, it will actually also go through the heat exchanger, which I consider that as your body's heat pack your muscles, this is where the magic happens. The heat exchangers like the warm muscles in your body, when your body shivers, your muscles heat up, and the heat exchanger does the very same thing. Your furnace is like your heat source, food burner in your belly. The furnace is very much like your belly after you eat food. It burns energy, gas or electricity, to make the heat, and that heat moves into the heat exchanger. As warm air travels through the duct. It's the same concept as your blood is traveling through the arteries. It moves through the ducts, traveling through the arteries of the legs and the arms, and it goes to every room that needs to feel cozy. Once it's gone to every room, it's now going to return back to the return duct. Also consider it like your blood returning back to the heart. Since the rooms are going to cool down, that used air gets pulled back into the return and just like the cooler goes back to the heart to warm up again, your

thermostat is going to keep in check with your house in the way that your brain is wondering, is the house warm enough, and if not, it keeps telling the furnace to keep going, and it tells everything to continue the comfort levels that you're looking for temperature wise. Once it does reach that point, it's going to tell everything to stop.

RNB

Renee Nguyen Broussard

16:55

It's a little different for air conditioning. This concept, again, starts with the thermostat in the brain, where it basically says when to cool down when it gets too hot in the house. Same concept used air is going back into the air filter, and it's going to go across the evaporator coil, also known as your skin pores. This is where the air gets cooled down by touching the code coils. Kind of like how your skin sweats to cool you down again, it'll go across the blower fan, which acts like your lungs. It's going to breathe all that cool air out to the rest of the whole house. Keep in mind, there's a cycle that's usually involved. It's a magical juice. There's a refrigerant that turns into vapor that helps the home cool down, and that's usually found inside the evaporator coil. It's a special fluid, again called refrigerant, that turns into vapor and grabs the heat from the air. Once it does that the compressor, which is located in the outside condenser, remember, it's your heart. The vapor goes to the compressor, and the heart of the system squeezes the vapor super duper tight, building up energy, and pumps it outside. The condenser coil that's also located outside. The condenser acts like your skin pours, and that refrigerant is then released, releasing the heat through the condenser coil, kind of like how your body pushes heat out through your sweat. Once that happens, we have the expansion valve where the tiny arteries, as I like to think of it, it cools down, and the refrigerant is now a liquid again. It flows through an expansion valve like tiny arteries, getting blood moving very slowly, and then goes back inside to repeat the loop, very, very continuous cycle, vapor to liquid, liquid to vapor. And the cycle keeps going on. When your body keeps breathing and pumping blood, it's just like your air conditioning that want to keep your home cool and fresh all day long. Thank you for listening to me about learning about your HVAC parts and learning how your air conditioning heat works.

KS

Kendra Seymour

19:13

Renee, thank you so much for for explaining this in such a helpful way. I have a whole new appreciation. I think this is the first time I really understand how my system works and all the parts and why it's important. And we'll get into this in the later episodes that all of them are designed correctly. They're working correctly because it makes such a difference. You mess with any one part, and it throws the whole body out of whack. So thank you so much for for painting this in such a relatable way for everyone. Do you have like, any tips that you like to share with homeowners? I know sometimes when you're talking to clients, you you explain their system using this analogy, but is there anything else you'd like to add before we wrap up?

RNB

Renee Nguyen Broussard

19:58

Absolutely, I definitely recommend homeowners to always have their HVAC maintenance. They usually have them done twice a year. Just like you maintain your body and keeping it healthy, you should do the same with maintenance. With that being said, the extra precautions asking those technicians for for before and after pictures always ideal, because what may seem normal for the typical technician to say, oh, that's just a little dirt it gives you before and after, how often your system is dirty and what to expect for each maintenance cleaning. Your telltales are usually found in your coils inside your air handler, as well as the grilles that I mentioned that are usually on the ceiling. Um, some folks naturally think it's dust. Sometimes it's a little more. It's always good to take a deeper dive and keeping an eye for any symptoms, if you will, just like if you get sick, you're going to sneeze, you're going to cough, you're going to feel really awful. Your system has a way of having those telltale symptoms of where there's something deeper is going on with your HVAC system.

KS

Kendra Seymour

21:12

Yeah, and I love that, and I love you know, we talked about like, ask for a picture. I do that when they get to my home to service my system. I would say one of two things, like, can you let me know when you open it up? I would love to see my coils, and I would love to see my drain pan. And I always take a picture, because we know that those can be sources of microbial growth or biofilms or things that we just want to stay on top of. So awesome tip. Renee, thank you. If people had follow up questions or wanted to learn more and get in touch with you. How can they do that? Do you have a website? What information we'll link to it in the show notes for people watching?

RNB

Renee Nguyen Broussard

21:50

Absolutely. You can go to www.airelytics.com that is our website where you could check out what we do and the services we offer. You can also email me at airelytics, A, I R, E, L, Y, T, I C, S, LLC@gmail.com. We're happy to hear answer any questions that you may have or direct you in the right resources that you could think of. Thank you very much for having me. I hope it helps clear up the idea of how not scary your HVAC system can be. And thank you again.

KS

Kendra Seymour

22:25

Yeah, no, absolutely. And for everyone listening, we have an amazing lineup coming for you. So if you are retrofitting, meaning you're you're at a point where you need to replace your system. If you're building a home, we're going to cover everything that you need to know to be an informed and empowered consumer. And because I don't want you to miss any of these episodes as they drop, I want you to do two things for me, if you're watching on YouTube, hit that like and follow button, or if you're watching on Facebook, you can do the same. But then I also want you to head on over to ChangetheAirFoundation.org, and sign up for our newsletter, because it really is the best way to get great information like this and downloads directly to our inbox. And while you're there, you can also find our mini class series, this whole series, and our previous ones, underneath our resource tab. So lots of ways to connect with our material and stay up to date. So I hope to see you in part two with AJ Callegan, where we're going to do a deeper dive into the duck work. So thank you everyone. We'll see you next time you.