

Most Commonly Asked Questions about the Unico System

Can I heat as well as cool with The Unico System?

The Unico System comes standard with either refrigerant or hydronic based coils that can be used to heat and cool your home.

Which condensing unit must be used with The Unico System?

The Unico System can be used with almost any manufacturer of outdoor condensing units as well as geothermal units and air-to-water chillers and heat pumps.

How many sizes of units does Unico have?

Unico manufactures a 1 – 1.5 ton, 2 – 2.5 to, 3 – 3.5 ton, 4 ton and 5 ton capacity air handler.

Why is it important to use Small Duct High Velocity (SDHV) HVAC in a very tight home?

Very tight homes require two things; fresh air from the outside and superior air circulation inside. A standard SDHV product provides better indoor air circulation than standard conventional equipment and because of this provides better indoor air quality for the occupant.

Is SEER rating important when choosing an HVAC system for a sustainable home?

No because SEER takes into account only equipment, outdoor condenser and indoor air handler, and not duct efficiency or total building performance. The efficiency that matters in Green Building is the total building efficiency that takes into account all factors of construction. Which is why H.E.R.S. modeling is imperative to Green Building and SDHV provides the largest decrease in H.E.R.S of any HVAC system.

With high velocity HVAC, will the system be noisy?

No, when installed properly the system is as quiet as any other HVAC system.

Is high velocity technology new?

No, SDHV technology was developed in the early 1950s and has been the product of choice for older historic homes for years.



HVAC Solutions for Affordable LEED Platinum Homes



SMALL DUCT HIGH VELOCITY CENTRAL HEATING & AIR CONDITIONING FROM THE UNICO SYSTEM.
A UNICO WHITE PAPER PRESENTATION



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The Unico System
Green Series

The Unico System
Small-Duct Central Heating & Air Conditioning



The goal at Make It Right (MIR) New Orleans was to develop a repeatable process whereby every home built by the foundation was a sustainable green home that would meet the requirements for a LEED certified structure according to the USGBC's LEED rating system. Under the leadership of Jon Sader, Construction Director at the MIR project, the MIR team was able to develop a repeatable process for building Affordable LEED Platinum certified homes. After refining the process it was clear that there were several key elements necessary for accomplishing the goal. Those key elements were the use of Advanced Framing Techniques, Spray Foam Insulation, Small Duct High Velocity Heating Ventilation and Air Conditioning (HVAC) equipment, Photovoltaic Solar Panels, and constructing a home that has an extremely Air Tight Shell. These key elements gave MIR the ability to realize a cost savings of 20% when compared to a conventionally built home.

How Advanced Framing, Spray Foam Insulation, Solar Energy, and an Air Tight Structure Integrate with The Unico System

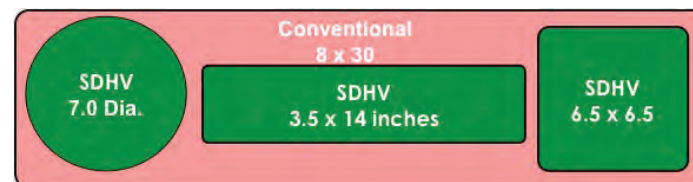
The project team determined that these construction techniques would reduce the overall cost of construction and would give them the ability to reach their goal of reducing costs by 20%.

Advanced Framing



The first technique that the team deployed was the use of advanced framing techniques (AFT) to frame the home. By framing the homes using AFT instead of conventional framing methods, and not sacrifice any structural integrity, they were able to reduce the lumber cost of for a

single home by up to 30%. This meant that they realized a savings of \$4500 per home. AFT also lowered the U-factor, the measure of how well a material (a window, door, or other construction element) conducts heat; the smaller the U-factor, the less heat is transmitted from the exterior of the building to the interior, because there were fewer 2x4s in the exterior walls to transfer the heat. This reduction in the U-factor meant that the mechanical systems would use less energy to heat and cool the home.



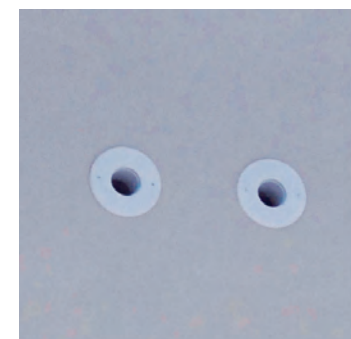
Small Duct High Velocity

Next was the use of small duct high velocity (SDHV) heating, ventilation and air conditioning (HVAC) equipment. The SDHV equipment provided several key benefits, true variable speed motor technology in the air handler, advanced software to manage airflow, smaller leak free ductwork, and the ability to integrate with several of the other techniques being used. Because of the smaller ductwork that is inherent to SDHV the team found that it was the best system of choice for advanced framing. No soffits, dropped ceilings or other additional framing was needed to accommodate the SDHV equipment. This was not the case with conventional HVAC. In order to use conventional HVAC dropped ceilings and additional framing was needed to accommodate the larger conventional ductwork, negating the savings that was realized by using advanced framing techniques in the first place. The team also found that the conventional HVAC equipment had to be oversized in order to accommodate the Minimum Efficiency Reporting Value (MERV) 11 that was a part of the air filtration system. The SDHV equipment

did not require oversizing and the net result was a savings of \$8000 per home on the HVAC equipment. And because the SDHV equipment uses aspiration to mix the air inside a room the team discovered better IAQ throughout the house than what conventional HVAC could provide.

Spray Foam Insulation

The third technique was the use of spray foam insulation (SFI). SFI was used for many reasons, the main reason was to provide as air tight a structure as possible as it sealed the house better than batt insulation. And, the tighter the structure the more energy efficient the home is and as a result the mechanical system uses less energy to heat and cool the structure. Spray foam insulation also provided additional structural benefits that fiberglass insulation could not.



An additional benefit from using SFI was the ability to imbed the SDHV ductwork into the insulation and in doing so provided a near leak proof air delivery system for the HVAC equipment. Because the SDHV ductwork is 1/3 the size of conventional ductwork it was possible to

place the ductwork in exterior wall cavities and between floor joists. Then, when the SFI was installed it not only insulated the structure but it also encapsulated the ductwork providing a 0% duct leakage air delivery system. This in turn increases the efficiency of the HVAC system which allows the entire mechanical system to be more energy efficient.

Air Tight Structure

An extremely air tight home is not only very energy efficient it is also an indicator of the quality of construction buy the builder as well. But an air tight structure also requires the builder to take into account the indoor air quality (IAQ) within the structure as there is no fresh air entering into the home and no stale air leaking out of the home. To determine the tightness of the homes at MIR a blower door test was done using the ASHRAE 62.1 - ACH/50 testing standards. Test results provide the home with a numerical score that equated to the tightness of the home. The best possible score is a zero, meaning no air was infiltrating the structure and no air was leaking out of the structure. The lowest score that was attained at the MIR project homes was an ACH/50 of .89, which equates to an extremely tight home. This low ACH/50 score meant that fresh air from the outside had to be brought into the structure to keep the indoor air quality

safe for the occupants, thus providing them with a comfortable and safe living environment. According to an Environmental Protection Agency report, "Americans spend, on average, 90 percent or more of their time indoors"

In an effort to take IAQ to an even higher level, the mechanical systems in the MIR homes utilize a Minimum Efficiency Reporting Value (MERV) 11 air filter because IAQ is directly related to an occupants comfort and health. A MERV 11 air filter has the ability to remove the cold virus from the air as it is returned to the HVAC unit. It is also considered to be a superior residential air filter which is why it was filter of choice of the MIR team.

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Solar Energy

The homes at the MIR project were equipped with a 4.1 Kw solar solution. The solar panels generate enough free energy from the sun that the homes are Net Zero, creating more energy that the home consumes. On average the mechanical system of a home is the largest consumer of energy in any home. The innovative technology built into the Unico System Green Series allows it to use less energy than standard SDHV systems. It also has a better total delivered efficiencies than conventional equipment which helped the MIR homes achieve the end result of a net zero home.

Better Performance with The Unico System

Small Duct High Velocity HVAC equipment provides benefits that standard conventional equipment cannot. SDHV uses a principal called aspiration whereby the high velocity stream of air exiting the wall outlet mixes with the air in the room more evenly than what a conventional HVAC system can achieve. Because of this the air in an entire room is thoroughly mixed leaving no hot or cold spots at the ceiling, floor or corners. Why does this matter, with extremely air tight homes the air in the entire house must be refreshed using fresh air from outside the structure. No stale air in the corners at the ceiling or floors that could lead to poor IAQ and affect the occupants comfort or health. Another benefit of SDHV is the ability to remove more humidity from the air. In high humidity climates, such as what they experience in New Orleans, The Unico System will remove 30% or more humidity from the air than a conventional system.