

The Unico System for Eichler Homes: Visionary Indoor Comfort System Complements & Preserves Visionary Design

The Vision

alifornia Modernists and Eichler aficionados are well-acquainted with Joe Eichler's Usonian-inspired vision of "bringing the outside in" through open room designs, floor to ceiling windows, glass transoms, atria, and walk-out patios. After all, these features are part of the intrinsic appeal of Eichler Homes and other post-WWII modernist residential designs. But, with the many forward-thinking design innovations and creature comforts offered in these types of homes, what seemed appropriate and advanced in decades past - like everything – changes with time.

The Issue

With the majority of Eichlers having been built in the '50s and '60s, many of the indoor comfort innovations introduced with these homes, such as in-floor radiant heating systems and single-story, open layouts conducive to natural cooling and ventilation, have either succumbed to old-age or no longer meet contemporary comfort expectations or current energy efficiency standards.

According to a November 2017 article in *The Sacramento Bee,* "by the end of the century...annual summer

The Unico System®



The Unico System's discrete outlets virtually disappear in the ceilings of this Marin County Eichler Home.

temperature averages in the Sacramento region are projected to increase between nearly 4° and 7° F.1" In recent years, the state has suffered prolonged heatwaves that have shattered historical records. Central air conditioning systems, considered a rarely-needed luxury in the temperate California climes of the past, is now a requirement for most homeowners.

The abundance of glass, connected open-areas, and flat, unbroken roofs covered with dark membranes so prevalent in mid-century modern homes, while assets to their charm and aesthetics, wreak havoc on the energy efficiency of conventional indoor comfort systems.

When a new HVAC system is retrofitted into an older home, the installer first performs heat gain and heat loss calculations to determine the home's required heating and cooling loads and the appropriate system size and layout needed. The heating load is the amount of heat energy that needs to be added to the home, while the cooling load is the amount of heat energy that needs to be removed from the home to maintain comfortable temperatures. Solar energy that infiltrates through windows, walls and roofs impacts these calculations and must be compensated for by the indoor comfort system. This can lead to HVAC system over-sizing and/or the system working longer and harder to keep temperatures comfortable, increasing energy usage and diminishing system efficiency.

Space is also a factor in adding HVAC systems to mid-century modern homes. Like Eichlers, most of these homes are constructed on concrete slabs, with no basements or crawlspaces in which to house HVAC equipment and ductwork. The open layouts, post-andbeam construction, and tongue and groove ceiling decking also present challenges and often require the addition of soffits or dropped ceilings to conceal ductwork. To owners and preservationists, these compromises are the architectural equivalent of painting a moustache on the Mona Lisa.

For owners and enthusiasts of these homes, the question is: How to update them for 21st-century needs while maintaining their original charm and appeal?

The Solution

The Unico System is a small-duct central heating and cooling system which uses a main duct, or plenum, that is 1/3 the size of traditional HVAC systems. The supply ducting that branches off the plenum to deliver conditioned air to various rooms, consists of flexible, insulated tubing with a 3.5-inch outer diameter. These supply tubes snake through small cavities within homes and terminate in unobtrusive round or slotted outlets that can be stained, painted or wallpapered to match any décor.

The Unico System allows not only for the introduction of an indoor comfort system that is unobtrusive and aesthetically pleasing, but also provides comfort and energy efficiency far superior to that of its conventional counterparts. The unique, sound dampening design of the supply tubing ensures whisper-quiet operation. Because Unico air distribution works on the principal of aspiration, conditioned air is gently mixed with a room's natural airflow, eliminating the hot and cold spots and drafts associated with traditional "dump-and-throw" HVAC systems. Because The Unico System removes 30% more moisture than conventional systems, occupants can feel cool and comfortable at higher thermostat settings, increasing the system's operating efficiency.

The Unico System has been installed in over 600,000 homes within the U.S., including many Eichlers and California Moderns, and enjoys the distinction of being the only HVAC system endorsed by the National Trust for Historic Preservation. Because of its ability to provide superior indoor comfort while maintaining the integrity of historic structures, the National Trust has installed The Unico System in President Lincoln's Cottage and the Petersen Home (where Lincoln died) in Washington DC.

Advantages Over High-Wall Split Units

Some HVAC professionals have proposed the installation of wall-mounted, single-room units – also known as high-wall splits – as an indoor comfort solution for Eichler and California Modern homes. However, this "solution" presents a host of problems in comparison to The Unico System.

High-wall splits are, essentially, suped-up window A/C units – without the need of a window. These ugly white, beige, or black units are typically one-foot tall by threefeet wide and need to be placed on a room's exterior wall. Ceiling mounted units are also possible, but the ceiling often needs to be dropped to accommodate this feat.

By their very design, high-wall splits are not a central heating and cooling solution but, rather, address indoor comfort needs in an inefficient, room-by-room approach. They disrupt and mar the home's aesthetics with their bulky, obtrusive placement (often above sofas, chairs, and beds) and are woefully lacking in their ability to comfortably heat or cool a home. High-wall units dump 80% of their conditioned air into only one-third of a room's existing air volume, creating uncomfortable drafts and temperature variations as high as 8° F.



You'll have to look closely to spot The Unico System outlets in this picture of the open kitchen area.



Floor to ceiling windows are a wonderful feature, "bringing the outside in" with light and phenomenal views. However, the solar heat they also let in can overwhelm conventional HVAC systems.

High-wall units provide no humidity control or ability to provide fresh outdoor air and, additionally, at almost twice the decibel levels, are far noisier than The Unico System. Since they are not a whole-house solution, each unit must work separately to control the temperatures in each room, meaning higher monthly energy costs.

When compared to The Unico System, high-wall splits are no solution at all.

Benefits

- Flexible design and installation no need for extensive remodeling
- Quiet operation
- Even, draft-free temperatures
- Discrete supply outlets outlets virtually disappear and preserve aesthetics
- Energy Efficient
- The only HVAC system endorsed by the National Trust for Historic Preservation.

¹http://www.sacbee.com/news/politics-government/ capitol-alert/article184244098.html#storylink=cpy

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Unico main trunks are 1/3 the size of traditional HVAC systems and available in a low-profile configuration. This Eichler Home installation demonstrates how the Unico plenum can be located on the roof with supply runs to various areas of the home. This low-profile duct can be covered with a light-colored roofing membrane for additional insulation and solar heat reflecting capabilities.

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- 17 SEER energy efficiency the highest energy efficiency on the market today
- Easy to create multiple zones of comfort in your home
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Unico, Inc. 1120 Intagliata Drive Arnold, MO 63010 +1 800 527 0896 +1 314 481 9000 www.unicosystem.com



Unico, Inc. is the leader in small duct heating and cooling systems and other high-end HVAC systems. The company manufactures all of its products in St. Louis, Missouri, with over 125,000 square feet of modern manufacturing space. The company is well known for extensive use in older, architecturally unique homes and buildings as well as elite, high-end custom homes. The company is family owned and operated and their products are available throughout the United States and Canada, and in over 28 countries around the world.





