

HEAT PUMP AND INSULATION PROVIDE YEAR-ROUND COMFORT FOR MID-CENTURY MODERN



Geoff and Electa Tritsch upgrade an iconic mid-century modern to a centrally ducted heat pump for quiet, even comfort.

Homeowners: Geoff and Electa Tritsch

Year Built: 1951

Style: Mid-century Modern

Size: 1800 sq.ft.

Weatherization:

18" fiberglass insulation in attic (R-50)

3-1/2" fiberglass insulation in walls (R-9)

Double-pane fixed windows; single-pane double hung windows with storms

Moderately sealed

Centrally ducted heat pump with electric resistance back-up

When the Tritsch family bought their first home in Medfield in 1980, they told the house inspector they wanted to install a wood stove. "Put the money into insulation", the inspector told them. "In two years you'll get the stove 'for free'." Good advice, especially when the Tritsches moved to their 1951 mid-century modern house in 2004. Uninsulated walls, 3" of attic insulation, and floor-to-ceiling glass made effective heating and cooling a challenge.



The House

The residence is an 1,800 square foot, single-family home built in 1951, part of an innovative experiment using new construction materials and building techniques. The house consists of two levels - an open floor plan main living space (living room, dining room, kitchen) and two bedrooms on the upper level and an office, guest room, and utility spaces on the lower level. The lower level is built half in-grade. There is extensive floor-to-ceiling glass on both levels. Windows are mostly single pane with storm windows except for the large, fixed windows which have been upgraded to double-paned. Heat was a 100,000 BTU oil-fired forced hot air furnace with central air conditioning. Heating oil consumption was about 600 gallons per year.

Additional weatherization

While the house was innovative in many ways, insulation was never a strong point. Improving the thermal envelope of the mid-century house has been a study in continuous improvement. First, 3" of fiberglass was blown into the uninsulated walls. Then, the owner and a local handyman added 8" of fiberglass batts over the 3-1/2" of rockwool in place in the attic. (This paid for itself in the first year.) After a 2015 GreenYourHeat audit, an additional 6" of fiberglass was added in the attic. Insulated drapes, caulking, and sealing all added incremental improvements and reduced oil consumption by more than one-third.

"We were worried that the heat pump would not meet all of the heating needs so we opted for the electric back-up heating coils which come on automatically as needed. Over the last three winters, despite extended cold spells of near or below zero temperatures, we have *NEVER* needed the back-up heating!"



10%

Operating Cost
Reduction

HALF THE NOISE

TWICE THE COMFORT

"... a huge improvement in our home's year-round comfort while reducing our operating costs and helping the planet."



Ducted Heat Pump Fits the Bill

The existing forced hot air oil furnace and central AC provided adequate heating and cooling but was noisy. The single speed fan would run (loudly) and then the house would get still between cycles. With only one zone (and no way to easily change the ducting to add more zones), the lower level was always colder than the upper level. When the condensate pan started leaking in the old furnace/AC, it was clearly time for an upgrade. Objectives for the new system were that it be quiet, have a variable-speed fan, move air uniformly and consistently, and be efficient. After careful research, a cold climate heat pump fit the bill and provided the added benefit of removing the oil tank to expand the owner's workshop area. The new heat pump was installed in the space of the old furnace and used the existing ductwork for a simple installation that did not change the look or function of the interior spaces. The replacement of the upstairs vents with "smart ducts", which automatically open and close as required, provides quiet, even heating and cooling to both floors.

Advice for others

If you presently have forced hot air, consider the use of a ducted heat pump rather than ductless units. While not all ducting will support the different air flow requirements of a heat pump, your contractor should be able to advise you. If you do decide to reuse your ducting, also consider air duct sealing to improve air flow and reduce heat loss into unconditioned spaces. Air duct sealing is covered under CMLP's weatherization rebate program.

The Tritsch family has no regrets in replacing their noisy oil furnace with a clean, quiet air-source heat pump. "It has made a huge improvement in our home's year-round comfort while reducing our operating costs and helping the planet. Can't ask for more than that!"

Interested in how heat pumps can make your home more comfortable and sustainable? Visit ConcordCleanComfort.org for information about coaching, rebates, and more.