

For Homeowner, HVAC is Rocket Science

Minnesota Residents Relish Whole-House, High-Efficiency, Mini-Split Solution

Bill Rouner is a physicist who spent much of his career in the aerospace industry working for Boeing and Honeywell. He fondly recalls his years of “bleeding-edge avionics” research and development for Boeing’s 700-class jets, the DC-9, and the Air Force E-3A AWACS, or airborne warning and control system.

So, it only made sense when he and his wife, Nancy Rouner, were looking for an air conditioning system for their older, hydronically heated home in St. Paul, Minnesota, four years ago, Bill Rouner did some research.

“At the time, my only experience with a/c systems was with central systems or old window-rattlers, which is what we had in the home,” Bill Rouner said. “We had an estimate for installation of a high-velocity system, but the price tag was a big deterrent. I was intrigued when I found information about mini splits on the Web.”

Bill read about how, by design, split-system condensing units and evaporators are separated, with refrigerant lines between them, that they can have precise zoning for enhanced efficiency, and that only a small diameter hole is needed to run the lines. Suddenly, a light went on, “Now there’s a solution for us,” he thought.

As luck and coincidence would have it, a neighbor’s home had recently undergone a mini-split retrofit, so the Rouners paid the system a visit. “My key concern was sound — rather, lack of it, which is what I wanted — and Nancy was more concerned about aesthetics. We quickly learned there was essentially no sound, and the wall units looked fine.”

They were also impressed with the equipment’s ease of installation, cost, comfort, and versatility. “I soon learned that cooling our home with mini splits would be substantially less than the cost of getting the job done with a high-velocity system,” he said.

Pleased Customers

“To learn the systems are heat pumps, and that our neighbors could not only cool, but also efficiently heat their home excited me,” said Bill Rouner. “Our immediate thought was, ‘How soon can we make this happen?’”

Within a few days, the Rouners invited Nick Steckahn in for a visit. Steckahn is president of Roseville, Minnesota-based Abbott Ferraro, a full-service mechanical contract-

ing firm serving the Twin Cities area. Abbott Ferraro is a Fujitsu Halcyon dealer — a status earned through extensive factory training and installation quality.

“A few days after his visit to the Rouner’s home [in 2011], Nick called in with a few questions and then placed his order for a 36,000-Btu Fujitsu multi-zone unit with

four 9,000-Btu heads through Johnstone Supply in Bloomington, Minnesota,” said Shawn Donovan, territory sales manager with Eden Prairie, Minnesota-based manufac-

turer’s rep firm Mondale & Associates. “He let me know soon after that, the Rouner’s were delighted with their new system.”

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“That’s something of an understatement,” said Bill Rouser. “Nancy and I were ecstatic. We wished that we had installed the mini-split system years earlier.”

Record Temperatures

Just five weeks after the installation of their first mini-split system, a weather pattern settled over the Rouser’s state with record-breaking temperatures and sloppy-wet humidity. “We got it in just under

air conditioning, it wasn’t a deal breaker. Bill and Nancy bought the home and made another call to Steckahn. Aabott Ferraro quickly got the job. This time, though, a much different approach was taken with the system’s installation.

Hybrid Solution

“We worked closely with the Rousers to provide a whole-house, high-efficiency, mini-split solution,” said Steckahn. “Because of the home’s woodwork and trim, Nancy made it very clear that she didn’t want wall units downstairs, preferring that all evidence of the HVAC system be hidden. Fujitsu’s ‘slim duct’ system permits air delivery via short



Andert makes a flare connection on the Rouser’s Fujitsu multi-zone condensing unit.

the wire,” recalled Bill Rouser.

“Our electric bill was a lot lower than the previous mild summer with three window air conditioners” he added. “The house was much more comfortable. And, that’s not to mention the sound of quietness. We were so conditioned to the noisy old window-rattlers. Good riddance. We would never go back to that nuisance again.”

The Rousers also found that the 18 SEER multi-zone heat pump could reduce heating bills, too. “We didn’t have to turn on the old boiler until we were deep into winter, and could turn it off much sooner than we were used to,” he said.

Last year, the Rousers were casually browsing real estate ads when an elegant, 1916 prairie school-style home caught their attention. “We’ve always admired the architecture of these homes,” said Bill Rouser. “What you see with prairie homes are horizontal lines, hipped roofs with broad eaves and, an open floor plan with loads of gorgeous quarter-sawn oak trim. This home had it all.”

For the Rousers, it was time to move. And though the hydronically heated house had no central

duct runs. So, we placed one evap unit in the basement and ran ducts to registers on the main floor.” Upstairs, the Rousers opted for wall units.

Steckahn explained that Halcyon Hybrid Flex Inverter systems are described as a cross between VRF (variable-refrigerant flow) technology and a more traditional multi-zone system.

“With the hybrid system, which we’ve been installing since its introduction five years ago, there’s a variable-speed compressor, zoned temperature control, and a reduced refrigerant path,” he said. “We had the ability to mix and match wall-mount, compact-cassette, and compact-duct indoor units. The Rouser’s could have several independently controlled zones.

“With the six different indoor air-handler Btu capacities and four different evaporator styles, there were thousands of possible combinations,” he added. “The compressor ramps up and down, depending on needs within the home. As set points are approached, the unit reduces Btu output and fan speed to remove more humidity. It’s always self-adjusting to remove the greatest amount of humidity possible.”



Philip Andert, project foreman, Aabott Ferraro, and Dennis Narog, installer, pull Fujitsu equipment from the truck for installation at the Rouser’s home. (Feature photos courtesy of Joe Szurszewski)



Nick Steckahn, president, Aabott Ferraro (right), introduces Nancy and Bill Rouser to one of the wireless remotes on their newly installed heating and cooling system.

Steckahn chose two 36,000-Btu multi-zone condensing units, five 7,000-, and one 9,000-Btu wall units, and 9,000- and 12,000-Btu concealed units for the Rouser’s 2,600-square-foot Summit Hill home.

“We really like the ability to install the short duct runs up to 15 feet in length,” added Steckahn. “Our installers use a ductulator to determine this. We especially like aerodynamic fittings to move more air, typically matched with 6-by-24-inch rectangular ducts.”

According to Phillip Andert, Steckahn’s lead installer for the Rouser home installation, if they need longer runs, they bump-up the duct diameter to 8 inches.

Born to Tinker

And, perhaps yet another coincidence, the summer of 2013 was

a scorcher. “We were so glad we installed the HVAC system, and were very pleased with its comfort and energy efficiency.”

There was a big surprise, however, when Bill began to tinker with system operation. Yep, always a scientist; born to tinker.

“We began to use the system in fan mode, purely as a way to pull warmth from the sun room, and to break up heat that’s trapped at ceiling level when it was cool outside,” explained Bill Rouser. With the downstairs unit’s fan set on circulation, and with the home’s 9½-foot ceilings, they easily moved Btu throughout the home’s lower level at only the cost to move the air.

“It was enough for us, all the way through November and early December, and then again in April,”

he added. “We’ve learned from fiddling with it that the fan mode is ideal for when temperatures dip down to 30°. Anything below that and we let the heat do its thing.”

“Bill’s discovery was a surprise for me, too,” said Steckahn. “I didn’t know just how much potential the sun room had as a source of warmth for the entire home with the HVAC system in the fan mode. What doesn’t surprise me is that Bill Rouser was the one to find it and put it to good use.”

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