

Tacoma, Washington

VIG HOME



CHALLENGE

Design an energy-efficient whole-home heating and cooling system for a new 2,300-square-foot home

SOLUTION

Single-phase, multi-zone, heat-pump system from Mitsubishi Electric with Lossnay® ERV

RESULT

Constant, comfortable temperature and significant energy savings

A commercial HVAC sales representative for Seattle-based distributor Thermal Supply, Inc., Shaun Vig and his wife purchased house plans in December 2005. After a few months of searching for land, the family found an ideal 4.5-acre parcel in Gig Harbor, a small harbor town 10 minutes west of Tacoma. The house plan was 2,300-square-foot with three bedrooms and a bonus room above the garage. Vig wanted to build it himself and design his own HVAC system. Having worked for years with Variable Refrigerant Flow (VRF) zoning systems from Mitsubishi Electric, Vig knew the system and trusted the technology.

PERFECT TIMING - MITSUBISHI ELECTRIC S-SERIES INTRODUCED

In the midst of planning, Mitsubishi Electric introduced the S-Series heat pump system, part of the VRF zoning systems. The S-Series features a single-phase outdoor unit that utilizes an INVERTER-driven compressor for energy effectiveness. The timing was perfect for Vig because the S-Series gave him more freedom and flexibility for heating and cooling his new home.

"In the S-Series I saw the potential for considerable energy savings as individual zones are heated or cooled only when they are being used or occupied," Vig said. "From my decade of selling and working with Mitsubishi Electric HVAC systems, I have been impressed by the quality of the equipment and intelligence of the technology, especially the variable

speed compressor. Since the outdoor unit does not have a lock rotor Amp rating, I can run the system by using my generator. This is a great advantage because we live in a rural area where power outages are common."

Vig also understood that he would have less ductwork to install. Placing fan coils in the zones they are serving reduces the main ductwork runs and saves considerable energy. "I designed the heating/cooling system with three zones, with indoor units serving the living/ kitchen/bedroom areas, bonus room and master bedroom. I used a 3-ton indoor unit for the main area, and 1-ton indoor units for the bonus room and master bedroom. The S-Series PUMY outdoor unit's variable speed compressor operates at a reduced load and provides us with huge energy savings because of less operating costs."

VIG INSTALLS AN ENERGY MONITOR TO QUANTIFY ENERGY SAVINGS

In an effort to fully understand the variable-speed compressor, Vig connected a meter and current transformer to the outdoor unit to monitor the Amp draw. From July, 2007 to March Over a period of 275 days, the total kWh usage was 9,061. The average kWh/day was 16.3 and the average price/kWh was \$0.059. With the S-Series system in place, Vig's cost to maintain the comfort level in his home during the month of October was just \$41 (694 kWh).

In October 2007 the Vigs celebrated the arrival of their first child. "Because of this event, we have been using our heating system more hours per day. My findings show how the INVERTER compressor operates to maintain a constant, comfortable 72 degrees Fahrenheit temperature for our new 2,300-squarefoot home."

CLIMATE IN THE PACIFIC NORTHWEST

"Compared to other parts of the country, our northwest climate is fairly mild," Vig said. "A few days this summer temperatures broke into the high 90s, however, we normally range between 70-80 degrees Fahrenheit. Our western Washington winter climate is mild so I didn't have to worry about back-up strip heat. For climates with cooler winters, Mitsubishi Electric indoor units are designed to control external duct heaters."

MITSUBISHI ELECTRIC VRF SYSTEMS: GREAT OPTION FOR RESIDENTIAL HVAC

"For more than 25 years, Mitsubishi Electric HVAC has been known for its popular and proven split-ductless systems," Vig explained. "Mitsubishi Electric's split-ductless systems provide great spot

heating and cooling solutions for many applications. However, with the S-Series 3- and 4-ton systems now available, we can offer whole-house heating and cooling solutions with VRF technology and ducted air handlers. Indoor air quality can be improved by adding a Lossnay® Energy Recovery Ventilator to the VRF zoning system. For comfort and true energy savings, the S-Series is a great residential HVAC solution."

"Although designed for managing up to 50 indoor units, I installed a G-50A Centralized Controller in my home system," Vig said. "The controller connects to my computer and is web accessible, giving me the ability to control my Mitsubishi Electric system from anywhere in the world. From a remote location, I can monitor, operate, schedule and gather maintenance diagnostics. That's a huge benefit."

Vig went on to say that thanks to VRF zoning technology, contractors can now offer their customers better indoor comfort because of the ability to meet the varying temperature needs of a home with just one system. "As a distributor, many of our customers are looking for cutting-

edge equipment and VRF systems from Mitsubishi Electric have been a superb solution. Mitsubishi Electric also offers technical classes on all their equipment ensuring that contractors are well-trained and well-qualified."

Vig said that Thermal Supply Inc. has been involved with more than 300 Mitsubishi Electric VRF zoning systems in the Northwest. "Our custom home market has really taken advantage of the S-Series, and I have even had a few contractors install the S-Series in older homes because of the selection of indoor units available for zones with no room for ductwork."

PROJECT TEAM

Owner:

Shaun and Coral Vig, Tacoma, Washington

General Contractor:

Shaun Vig, Tacoma, Washington

HVAC Engineer:

Shaun Vig, Tacoma, Washington

HVAC Contractor:

Shaun Vig, Tacoma, Washington

HVAC Distributor:

Thermal Supply Inc., Seattle, Washington

EQUIPMENT

- ▶ (1) PUMY S-Series (R410A) Outdoor Unit
- ▶ (3) PDFY Ceiling-concealed Ducted Cassette Air Handlers
- ▶ (2) Simple MA Remote Controllers
- ▶ (1) Deluxe MA Remote Controller
- ▶ (1) G-50A Centralized Controller