

High Efficiency Heat Pumps



James Dulley
www.dulley.com

If you're looking to install the most efficient heat pump for lower electric bills, paying attention to one that provides the best year-round comfort is a smart decision.

With the new minimum energy-efficiency requirements for 2006, there have been improvements in heat pumps that make them an excellent choice for almost any

home. The price of fuels, such as natural gas, oil and propane, are at record highs, so using a heat pump may be least expensive for home heating and cooling options.

Heat pump efficiency in the cooling mode is rated by SEER (seasonal energy efficiency rating) similar to a central air conditioner. In the heating mode, the efficiency is rated by the HSPF (heating seasonal performance factor). Generally, the ones that are most efficient at cooling your home are also the most efficient at heating. If you now have an old heat pump with a SEER in the 8.0 range, installing one of the most efficient (SEER of 19) new ones could cut your utility bills by more than 50 percent.

Many of the HVAC (heating, ventilation, air-conditioning) manufacturers are starting to recommend hybrid heating, even in colder northern climates. Hybrid heating refers to installing a heat pump, instead of just a central air conditioner, along with a fossil fuel furnace.

During mild weather, the heat pump can be less expensive to operate than even the most efficient fossil fuel furnace. When the outdoor temperature drops, the furnace takes over. A heat pump of the same capacity, efficiency and features may cost only about \$400 to \$500 more than the equivalent (cooling only) central air conditioner.

As a brief background, a heat pump is basically a central air conditioner with a reversing valve. When switching from the cooling to the heating mode, the reversing valve reverses the direction of the refrigerant. The hot gases flow through the indoor blower coil to heat the air inside your home. The wall thermostat takes care of automatically switching the reversing valve depending upon whether you need heating or cooling.

A two-stage heat pump is your most efficient option and it also provides the best comfort. The heat pump has two different output levels when heating and when cooling. This allows the heat pump to be sized to handle some of the coldest or hottest days, yet also be effective during milder weather. Depend-

ing upon the compressor design, the heat pump lower-output level will be from 50 percent to 67 percent of the maximum higher-output level. A third stage is the backup electric-resistance oil or gas furnace.

This is a great advantage because the heat pump runs in longer, more efficient cycles when it is operating in the lower-output level. Even though it is running longer, the compressor is using less electricity in this lower-output level so the overall electricity usage is reduced. By running longer and slower, there is less indoor blower and air flow sound and indoor temperatures remain more constant.

The majority of the HVAC manufacturers have switched to using a two-stage scroll compressor with R410A refrigerant instead of R-22 (commonly called Freon). R410A is much more environmentally friendly than R-22 and it operates at slightly higher pressures. This requires more stout tubing, so the noise level from the outdoor unit is less noticeable. By 2010, manufacturers will no longer be allowed to produce units using R-22.

Over the past several years, there has been quite a design push to make the outdoor unit run more quietly. This is accomplished by insulating the compressor motors, using more sound-damping mounts and redesigning the fins, fan blades and housing for quieter air flow. Most of the manufacturers can provide you with sound level ratings for their various models. Sound level does vary by size and compressor type.

Most two-stage heat pumps use a General Electric variable-speed ECM blower motor in the indoor air handler. This efficient motor varies its speed depending upon the heat pump stage currently running and the air flow resistance in the ductwork. Heat pump efficiency and indoor comfort depends upon matching the outdoor unit, the indoor coil and the blower speed (air flow).

One of the key advantages of the variable-speed blower, when used with the proper thermostat, is in controlling the indoor humidity level. This affects comfort and common allergens such as mold spores and dust mites. By varying the indoor air flow, the ratio of cooling to dehumidification can be controlled. This is ideal for humid climates.

Write for (or instantly download at www.dulley.com) Update Bulletin No. 763 – A buyer's guide of the 21 most efficient, comfortable heat pumps listing number of stages, efficiency, compressor, refrigerant, size, blower speeds and a savings/payback chart. Please include \$3 and a business-size SASE.

Send inquiries to James Dulley, Cooperative Connections, 6906 Royalgreen Dr., Cincinnati, OH 45244

Basin Electric Record Set

While thermometers consistently showed triple digit temperatures throughout the upper Midwest in July, Basin Electric's member systems continued setting all-time member load peaks. In fact, another new estimated peak was set on July 30.

The new billing peak is expected to be approximately 1,950 megawatts (MW), said Dave Raatz, Basin Electric manager of marketing and power supply planning. It surpasses the previous estimated peak set in the middle of July by about 50 MW. However, exact numbers for the billing peaks won't be available until mid-August.

According to Raatz, Basin Electric's base-load and peaking resources have been running well throughout the hot weather.

Basin Electric requested that The Coteau Properties Company Freedom Mine shut down its dragline operations Saturday and Sunday. The coal company uses electricity from nearby Antelope Valley Station to run the dragline.

"We are fortunate to have this ongoing agreement with Coteau. The additional power is freed up and made available for the membership," Raatz said.



Vietnam Era Vets to be Honored

South Dakotans are gearing up to recognize the state's Vietnam War era veterans in a celebration Sept. 15-16 in Pierre, S.D.

Organizers are calling the events surrounding the dedication of the South Dakota Vietnam War Memorial a "Welcome Home and Thank You 30 Years in the Making."

"On Sept. 15-16, these veterans will receive a long-overdue welcome home," said Gov. M. Michael Rounds in a letter asking for support of the event.

South Dakota's electric cooperatives are joining in the festivities as one of the corporate sponsors underwriting the costs of bringing Huey helicopters in for the event. The cooperatives will also have a float in the Saturday morning parade that is expected to have 1,000 entries in it. As was done in previous war memorial dedications, the cooperative float will feature veterans who are employees or



directors of the state's electric cooperatives. More than 60 individuals have been identified and approximately half are expected to ride the float.

Vietnam War era veterans with South Dakota ties who had active duty military service between Feb. 28, 1961, and May 7, 1975, are asked to register for the event at www.sdvietnamwarmemorial.com.

Memorial Dedication Schedule of Events

September 15

"The Wall"/Fallen Sons of South Dakota – A replica of the Vietnam Veterans National Memorial and crosses representing the fallen sons of South Dakota will be on display.

Sky Soldiers Huey Helicopter Rides and Vietnam-Era Helicopter Display – The sights and sounds of the infantryman's lifeline will be featured in this live display of Vietnam era helicopters. *Sponsored in part by Touchstone Energy® Cooperatives of South Dakota.*

1960s & 1970s Muscle Car Show – Come see the cars that many veterans drove upon returning home.

LIVE Vietnam Radio from the State Capitol Grounds – State-wide disc jockeys from radio stations across the state will spin the vinyl from the 60s and 70s.

USO Tents/Welcome Center/Information Booths – USO tents, complete with donut dollies.

The Welcome Center and Information Booths will be available and are open from 8 a.m. to 8 p.m.

Food and Souvenir Vendors – Refreshments and event souvenirs will be available for purchase adjacent to the grounds of the state capitol.

The Beach Boys with Special Guest Red Willow Band Concert – Concert begins at 7:30 p.m. and complimentary tickets are available for veterans.

September 16

USO Tents/Welcome Center/Information Booths – The Welcome Center and Info Booths are open from 6 a.m. to 6 p.m.

"The Wall"/Fallen Sons of South Dakota, Vietnam-Era Helicopter Display and 1960s and 1970s Muscle Car Show continue.

Parade – Starts at 9:30 a.m. Estimated to be one of the largest ever held in South Dakota, featuring

up to 1,000 entries.

Dedication Ceremony – Starts at 2 p.m. A dramatic military and civilian ceremony to say thank you to our Vietnam veterans after more than 30 years.

Find a Buddy Tent/Locator Service – Locator service to assist vets in finding friends and fellow veterans. Counseling services will also be available at these tents upon request.

The Steve Miller Band with Creedence Clearwater Revisited Concert – Concert begins at 6 p.m. and complimentary tickets are available for veterans.

Fireworks Finale

September 17

The Vietnam Wall Display, Information Booths and Counseling Services will be available until 1 p.m. Sunday.

* This schedule is tentative and subject to revision.