

Single-phase current does the job for less

By ALAN NEWPORT

WHEN David Sowers switched motors on his irrigation system last year, he may have found one of the few remaining energy bargains in the irrigation industry.

Sowers replaced a 454-cubic-inch natural-gas engine at his ranch in northeastern New Mexico with a new, single-phase, 100-horsepower unit. He figures the change saved him about \$11,000 per month in energy costs.

Before making the change, Sowers calculated the cost to irrigate his alfalfa hay crop with his natural-gas engine, using 80-cent natural gas, at about \$13,800 for 30 days. The highest bill he paid last summer with the new unit was \$1,800 to run for 21 days, so the equivalent cost for a full month with his new electric motor would be about \$2,600, hence the \$11,000 savings.

That makes the payoff period on Sowers' new equipment an unbelievable two months. He spent about \$22,000 (after a rebate from his local power company) to buy the new Written-Pole single-phase electric motor, mount it on a platform and put a new gearhead on his well.

The entire scenario was possible because Sowers was able to purchase and use a high-efficiency, single-phase motor which can operate on existing electrical lines. No three-phase power necessary.

New technology

These Written-Pole motors range from 15 to 100 hp. They use a large bank of capacitors and a computer control to keep amperage requirements at startup very low. They build up to speed slowly instead of kicking in at full power immediately like most electric motors. As a result, Sowers says, it takes less amperage to start his 100-hp motor than it does to run most homes.

Dave LaBrie with Husker Power Products in Hastings, Neb., says this easy start-up typically surprises his prospective customers. Husker Power is the distributor for Written-Pole motors in the central Great Plains.

"We have a 30-hp motor on a trailer as a demonstration unit. We start it in people's shops with a 100-amp breaker, and the lights don't flicker and the computers stay on," LaBrie says. "They can't believe it. It takes less starting amps than a table saw."

Key Points

- Unit wrings up to 100 hp from a single-phase service.
- The new motors require little attention or maintenance.
- Many power providers offer rebates to help with purchase.

LaBrie says he hasn't gotten any hard numbers from his dealers and their customers yet, but initially he believes most Written-Pole owners are saving 40% to 50% in energy costs on wells where they previously used natural gas.

"These motors are expensive; there's no doubt about it," LaBrie adds. "And we don't fit everywhere because our limiting factor is 100 hp."

A generator set (a diesel or natural gas engine powering an electrical generator) can easily start at \$25,000 to \$30,000. LaBrie says Written-Pole electric motors of 50 to 100 hp usually cost \$16,000 to \$23,000.

Sowers looked into three-phase motors with single-phase conversion, but says the price tag for that whole package was \$55,000 to \$60,000. The manufacturer told him the motor

would lose half its life laboring under the conversion.

More benefits

Since Written-Pole motors run at about 95% efficiency, some electrical cooperatives offer rebates for installing them.

Another benefit is electrical motors are low maintenance, and Sowers says his Written-Pole motor has so far been flawless in that area. "You don't have to grease it, you don't have to change the spark plugs and you don't have to change the oil. You just turn it on.

"And it's quiet, too."

After a bad lightning storm passed within a few miles of him last year, Sowers found his new motor would not start. Fearing the worst, he called the manufacturer. After some dialog and directed button pushing, the problem was easily solved. The computer in the motor's control box had sensed a power surge and shut everything down to protect the unit.

■ For more on Written-Pole motors, go to www.precisepwr.com or call LaBrie at (800) 752-0888.



SUPPLY LINE: All the current that's needed for a 100-horsepower Written-Pole motor on David Sowers' New Mexico irrigation well comes in through a single-phase electrical line.



EFFICIENCY TECHNOLOGY: This bank of capacitors and the computer control module inside the box is part of the technology that helped Sowers use single-phase electricity to save over \$11,000 in energy costs on this well last summer.