

VFDs have waged winning battle for hearts of supers

By KEVIN KNIGHT

A big controversy among golf course superintendents is whether variable frequency drive (VFD) pump systems offer significant benefits over "conventional" systems with pressure-reducing valves. At trade shows, seasoned veterans argue the pros and cons of system maintenance, power consumption, reliability and more.

Several things become clear, however:

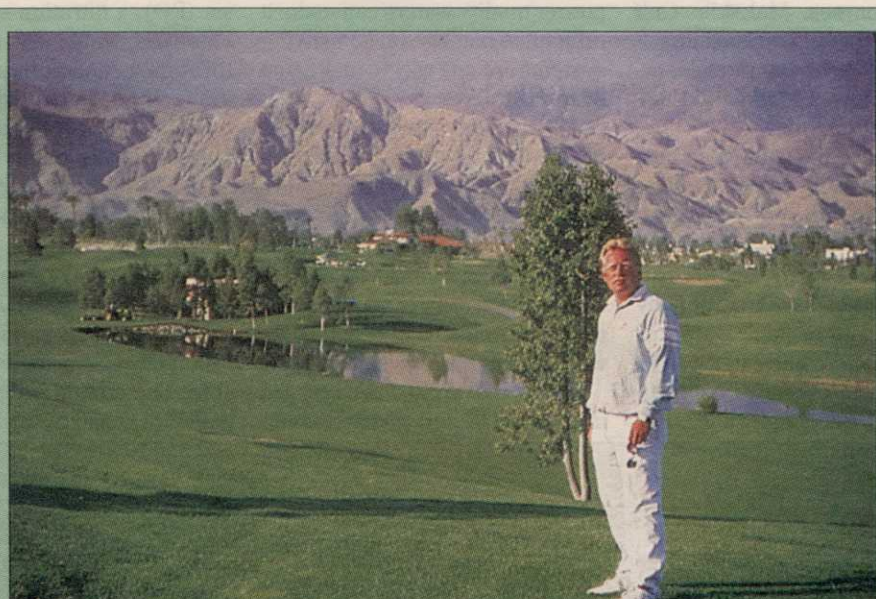
- Conventional systems are more established on golf courses but VFD systems are growing in popularity.
- VFD systems tend to be more expensive but they eliminate water hammer, provide significant energy savings and reduce maintenance.
- As VFD technology becomes more popular, prices will continue dropping.

To better understand VFD technology, seven golf course maintenance professionals across North America shared their opinions on VFD systems.

POWER SAVINGS

Since its studies have shown VFD tech-

Kevin Knight is a freelance writer based in Dallas Texas.



Roger Compton overlooking Mission Hills Resort Course, with the pumphouse in the trees in the background. Photo courtesy of Flowtronex International

nology saves power, Southern California-Edison has offered significant rebates — representing up to 30-percent discounts — for conserving energy.

"In 1989 I compared power usage between two identical pump stations," said Cal-Edison engineer Tom Olson. "One was

a conventional unit. The other was its replacement, a VFD system. They had identical pumps and motors and moved the same amount of water. The VFD system was nearly twice as efficient as the conventional system and saved the golf course \$12,000 annually in power costs."

Although such huge savings aren't the rule, engineers like David Brockway of Flowtronex International say savings of 20 to 30 percent are typical.

"There have been a lot of debates among people wondering if these systems actually use less power," Brockway said. "The easiest way to answer that question is by asking a superintendent who made the switch. In seven years I haven't found one who hasn't noticed an improvement."

Superintendent Ian Chapman of Castlemoor Country Club in Toronto, Canada, has documented 30-percent power savings since converting his system to VFD three years ago.

"We were spending \$4,000 to \$5,000 annually to power the irrigation system. One year after converting to VFD we pumped 21 million gallons and only had a \$2,800 power bill. Those kind of savings add up," Chapman said.

He added that lower electric bills are only part of the reason for converting. "A lot of people said these systems were overkill for Northern courses with short golf seasons. I don't buy that. Fewer line breaks (due to reduced water hammer) justifies VFD. Power savings are just the cherry on

Continued on page 24

Rotors saving water, energy and turf in increased use at golf courses

By PETER BLAIS

Water shortages, higher costs and increased effluent use have led to climbing sales of part-circle irrigation rotors, industry experts report.

Part-circle rotors are adjustable, allowing superintendents to place water exactly where they need it and avoid areas better left unirrigated.

Full-circle models, on the other hand, distribute water evenly in a 360-degree pattern. That can waste water on areas that don't need it, said Rain Bird's Scott Salter.

Full-circle rotors can also cause an unwanted scalloping pattern to the turf when used along the edges of wall-to-wall irrigated areas, according to Toro Co. Golf Marketing Division Manager Scott Morgan.

Full-circle models comprise the bulk of sales in most Eastern areas, where water supplies are plentiful and effluent use is rare, irrigation company executives agree. Rain Bird's full-circles outsell part-circles 4-to-1 there, Salter said.

"In the Northeast, the ratio might be more like 99-to-1 [in favor of full-circle]," said Hunter Industries Golf Division Sales Manager Gard Craw.

But in the South and West, where droughts have taken their toll on water supplies, coats have risen and effluent use is heavily regulated, part-circles have caught up and will soon pass full-circles in sales, Salter predicted.

Toro's part-circle sales constitute 30 percent of its rotor sales, up from 25 percent a few years ago, and will continue to climb.

Continued on page 23

Part-circle rotor manufacturers and their models

*Under Valve-in-head model availability
E-Electric, H-Hydraulic, C-Check valve

Company	Model	Radius range (ft.)	Flow (gal./min.)	Pressure range (psi)	Factory pressure setting (psi)	Factory setting	Inlet size (in.)	Outlet trajectory (degrees)	Max. stream hgt. (ft.)	*Valve-in-head availability
Buckner Inc. 4381 N. Brawley Fresno, Calif. 209-275-0500 Dave Truttmann Circle #170	91CV	53-61	12.9-20.4	50-80	N/A	N/A	1	24	N/A	C
	P-71-VIH	49-68	13.2-29.5	60-80	N/A	Adjustable	1.5	22-23	N/A	E
Hunter Industries 1940 Diamond St. San Marcos, Calif. 619-744-5240 Gard Craw Circle #171	G-550	42-70	2.6-30	30-90	N/A	N/A	1	24	N/A	H,C
Rain Bird Sales 145 N. Grand Ave. Glendora, CA 818-852-7227 Scott Salter Circle #172	95D	66-98	26.1-67.2	60-100	80	Adjustable	1.5	23	17	E,H
	47D	49-61	9-17	50-100	60-80	Adjustable	1.5	23	15	E,H
The Toro Co. 5825 Jasmine St. Riverside, Calif. 714-785-3555 Jim Wright Circle #173	650 690	53-86 78-108	11.7-43.7 45.1-82.2	40-100 60-100	50, 65, 80, 100 80-100	Multiple fixed-4 Multiple fixed-2	1.5 1.5	25 25	12.5-18 21-27	E,H,C E,H,C
Thompson Corp. 5075 Edison Ave. Chino, Calif. 714-591-4851 Larry Fossan Circle #174	#1000 Plastic	30-110	2-80	20-100	N/A	Adjustable	1-1.5	23	0	E,H,C
	180 Commander Brass	30-110	2-80	20-100	N/A	Adjustable	1-1.3	23	0	E,H,C
Weather-matic P.O. Box 180205 Garland, Texas 214-278-6131 Gene Johnson Circle #175	PK	41-73	3.6-40.7	40-100	50-80	Adjustable	1	25	18.5	C
	K90	85-101	37-78.3	60-100	80	Adjustable	1.3	23	18	N/A
Weather-Tec Corp. 5645 Clinton Fresno, Calif. 209-291-5555 Nick Dvorak Circle #176	UR-BPC	45.5-65.5	10.6-28.7	40-80	Not pre-set	Adjustable	1	25	N/A	N/A
	35-94	47.5-104	11.6-82.7	50-100	Not pre-set	Adjustable	1.3	23	N/A	N/A

VFD pump systems winning converts nationwide

Continued from page 21
the cake."

VFD systems are more sophisticated than their conventional counterparts. But many golf course professionals say they are more dependable since solid-state electronics replace hydro-mechanical controls.

Jeff Nack manages two courses for the city of Naperville, Ill., and said he's worked with every type of pump station made during the past 20 years. In 1989 he convinced city managers to buy a VFD system for the community's new course.

"We haven't had any problems to speak of. Unfortunately, I can't say that about the conventional station on our other course," Nack said. "The worst thing about VFD technology is that it can make you become complacent. Buy a good system and there simply isn't any reason to inspect it very often."

Roger Compton agrees. As director of golf course maintenance for Mission Hills Resort Hotel Golf Course in Southern California, Compton has his hands full taking care of two spectacular, desert courses. The last thing he or his staff want to babysit are pump stations.

"When our first golf course was started nearly nine years ago, a conventional station with 500 horsepower was installed. Our electric bills averaged \$12,000 to \$14,000 per month and it was eating our lunch on service. For instance, 1986 was a

good year — only 17 service calls," said Compton, who has been superintendent for six years. "We started researching VFD technology back in 1988 and decided it was the way to go. Since installing the system in July of that year, we haven't had any service problems worth mentioning. It has computer controls, runs at lower pressures and has saved us a fortune in power bills."

LINE BREAKS REDUCED

Perhaps the biggest benefit of VFD systems for golf course superintendents is reduced line breaks. Properly designed variable speed systems quickly respond to flow changes and slowly ramp up pressure. Together, these virtually eliminate water hammer associated with conventional systems.

Loy Faulk, superintendent of Rolling Hills Golf Course in Davy, Fla., had a conventional station irrigating 18 holes from 1982 through September 1991. He said it was a source of endless headaches, causing two or three line breaks each week — some of them with gushers big enough to swallow golf carts.

"We spent more than \$50,000 repairing that old pump station during its last two years. Something had to be done," he said. "It would have cost over \$25,000 to upgrade that system to a better conventional arrangement. We decided to retrofit a VFD

system, which ran us \$35,000 installed."

Although the new system cost more, line breaks have fallen dramatically from the old average of several per week. That is consistent with the experience of Dan Wegand, superintendent of Squaw Valley Golf Course, a year-old facility in central Texas.

"We all want to save energy, but reducing maintenance costs is what really matters," he said. "When we were shopping, we didn't even consider a conventional system. We're scared of water hammer because that's where you get all the line breaks. Since installing this (VFD) system, we haven't had one break. There's no water hammer with variable speed."

EASY ADJUSTMENTS

The last major benefit cited for VFD systems is their flexibility. Computer controls and "intelligent" software can direct the system to maintain a precise pressure — or range of pressures — so a course's needs are exactly met.

Butch Hartline has been fine-tuning his system in Plano, Texas, for the past five years. "We're working at 105 pounds pressure after starting at 120. We gradually brought it down and haven't noticed any problems. I don't expect to go any lower since this keeps power bills and water hammer low while still covering the course," he said.

Fifteen-hundred miles to the west, Ed St. George said he has also gained huge improvements in performance by adjusting pressure settings at Sunrise Country Club in Rancho Mirage, Calif.

"Part of my job is to keep an eye on finances, so I pay special attention to energy costs," he said. "In the first full year after we switched to a VFD system (1990), the amount of energy needed to pump an acre foot of water dropped 46 percent. That saved us more than \$20,000 annually. Since then, we've adjusted the pressure downward, from 100 psi to between 90 psi and 70 psi, depending on the area being watered. That's lowered operating costs even more.

U.S. pump manufacturers

Berkeley Pumps
293 Wright Street
Delavan, Wis. 53115
Phone: 414-728-7439
Contact: Pat Flanagan

Carroll Childers Co.
P.O. Box 750549
Houston, Texas 77275
Phone: 713-991-7501
Contact: Lee Mangum

Commercial Pump Service Inc.
401 Broadway
Swanton, Ohio 43558
Phone: 419-825-1148
Contact: Carol Dunbar
Circle #172

Flowtronex International
P.O. Box 20365
Columbus, Ohio 43220
Phone: 614-442-5850
Contact: David Brockway

Pumping Systems Inc.
10717 Harry Hines Blvd.
Dallas, Texas 75220
Phone: 214-357-1320
Contact: Robin Shores

Syncroflo Inc.
6700 Best Friend Road
Norcross, Ga. 30071
Phone: 404-447-1227
Contact: David Thrailkill

Watertronics
P.O. Box 530
Hartland, Wis. 53029-0530
Phone: 800-356-6686
Contact: Robert Emmerich

Western Pumping Stations
17046 S. Weber Dr.
Chandler, Ariz. 85226
Phone: 602-961-0150
Contact: Fred Freshley

"I only have to press a few buttons on the control panel to make the changes."

DECISIONS, DECISIONS

One Florida superintendent said a conventional system might be the answer for golf courses that have "super-low power costs or a very short season."

Everyone interviewed said the best way to make a purchasing decision is by nailing down course irrigation requirements, then talking with manufacturers and other superintendents.

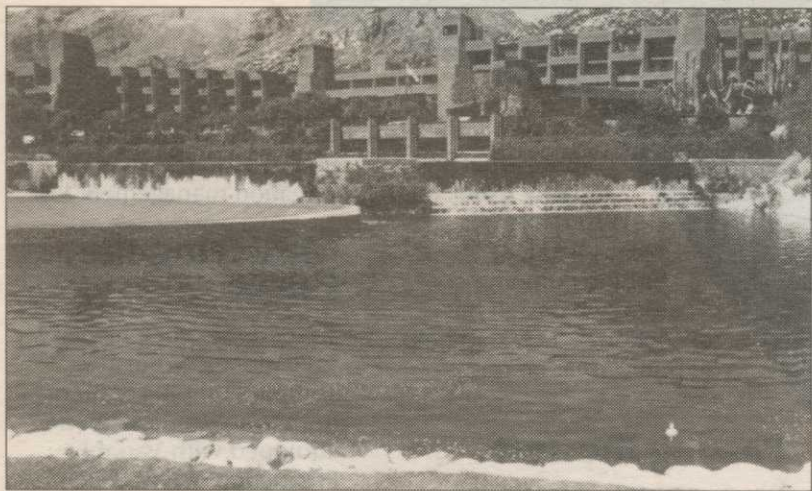
If VFD offers the best performance, several questions should be answered:

- When did the manufacturer install its first VFD system?
- How many VFD installations does it have in service?
- Are the computer controls "user friendly" so a superintendent can easily change system performance?
- Are VFD-trained service technicians readily available?

It's also worthwhile getting the names and phone numbers of several superintendents whose VFD systems have been operating more than two years. The final step should be visiting several VFD pump stations to see how different manufacturers designed and built their units, and how well they perform.

(Editor's Note: A free brochure, "VFD Pump Technology: The Basics," is available from Flowtronex. Call 800-537-8778.)

Success In Golf Is Often Measured In Inches.



The scenic 18th green and unique water feature at Ventana Canyon Resort near Tucson, AZ.

At The Watersaver Company, We Measure Success In Zero Leakage.

For over 20 years, our lining systems have been used to prevent seepage loss in lakes for some of the country's finest golf courses.

We specialize in the fabrication and installation of membrane liners for decorative lakes, traps, greens and aquascapes. So, before you design or build your next project, talk to us.

We can assist you with the right technology that will prevent your work from becoming a real hazard.

And, if your existing lakes are showing signs of leakage, it may be time to retrofit with Hypalon* or PVC membrane liners fabricated for both durability and cost effectiveness.

For assistance with specifications and cost estimates on your next golf course project, contact the Watersaver Company today!



*Hypalon is a Registered Trademark of E. I. DuPont

WATERSAVER CO., INC. • Plant/General Office • 5870 E. 56th Avenue • Commerce City, CO 80022
PO Box 16465 Denver, CO 80216 303-289-1818 • 800-525-2424 • FAX 303-287-3136

SURE-FLO The Self-Cleaning Strainer

Several styles of foot valves with Self-Cleaning Strainers.



55 to 2,500 G.P.M.

patent no. 4822486

High and low pressure models available.

Manufactured by:
Perfection Sprinkler Co.

2077 S. State St.
P.O. Box 1363
Ann Arbor, MI 48106

Phone 313-761-5110
FAX 313-761-8659



CIRCLE #142