

Project Profile

Technology Manufacturer

Round Rock, Texas



Fortune 500 technology manufacturer achieves \$1 million in energy savings with YORK® OptiSpeed® Variable-Speed Drives

Imagine the challenge of providing comfort cooling to 20,000 employees across a 4.5 million square foot campus. Now, imagine *keeping* them comfortable, while *cutting energy consumption* by 10%. That was the challenge faced by facility managers at the world headquarters of a technology manufacturer located in Round Rock, Texas.

In the highly competitive personal computer industry, every dollar counts. Operational costs must be kept in check to hold product prices down. So when the facility managers began to explore their options to cut energy costs, they reached out to Johnson Controls, a company they'd been working with for nearly 20 years. In response, the Johnson Controls team developed a plan to increase the efficiency of the campus' existing Trane® chillers, using the latest in YORK Variable-Speed Drive (VSD) technology.

VSDs cut energy use and reduce emissions on any brand chiller

Johnson Controls has been manufacturing variable-speed drives for centrifugal chillers since 1979 and, today, YORK OptiSpeed Variable-Speed Drives are designed to cut chiller energy use and carbon dioxide (CO₂) emissions by as much as 30% per year. YORK VSDs are universally applicable, too; they can be installed on any chiller, regardless of manufacturer. With that flexibility, the Johnson Controls team installed YORK VSDs on both Trane and YORK chillers, as part of an overall strategy to deliver energy and operational savings to the customer.





Outfitted with a YORK OptiSpeed Variable-Speed Drive and OptiView panel, this Trane chiller now operates more efficiently and is one of 20 chillers that has contributed to over \$1 million in energy savings at the Round Rock campus.

“Johnson Controls delivered results that far exceeded what we thought the solution could deliver. Their solution makes me look good to our leadership, and the company looks good to our customers and shareholders.”

**FACILITY MANAGER
TECHNOLOGY MANUFACTURER**

The project was implemented in two phases. Phase one, a proof-of-performance phase, included:

- **Energy-saving OptiSpeed Variable-Speed Drives with time-saving OptiView™ Graphic Control Centers:** YORK Variable-Speed Drives were installed – along with the required mounting, wiring and piping modifications – on two of the campus’ existing Trane chillers. Full-screen, full-color OptiView Graphic Control Centers were also added, making it easier than ever to operate the chillers. Key to the energy savings is the patented Adaptive Capacity Control (ACC) logic of the OptiView panel, which learns and remembers the surge line for the various operating conditions – a task which no standard, variable-speed drive can accomplish. Then, using this knowledge, the ACC logic determines the optimal motor speed and pre-rotation vane position, ensuring the consumption of the least amount of energy.
- **More efficient chiller operation:** During off-peak operations – nighttime, weekends, colder weather – chiller efficiency is further optimized by bypassing the orifice plate on the chiller. This allows operation with colder condenser water temperatures, resulting in lower motor speeds and increased efficiency.
- **Optimized operations for greater savings:** To achieve additional efficiencies, a condenser water reset strategy was implemented using the Metasys® building automation system. The strategy allows the Trane chillers to operate more efficiently by using lower condenser water temperature and ensures optimal efficiency by resetting the condenser water setpoint based on outside wet-bulb temperature.

Better-than-expected results lead to accelerated implementation of phase two

While the expected return on investment for phase one was 36 months, benefits were evident immediately. In fact, the customer’s energy use dropped by such a significant amount, the company’s accounting team thought its utility bills were inaccurate! Facility managers were so impressed with the savings, the company moved into phase two ahead of schedule. Two new YORK YK water-cooled centrifugal chillers – one 850-ton and one 460-ton – were installed on campus. Both chillers included OptiSpeed Variable-Speed Drives and OptiView Graphic Control Centers. VSDs were also installed on nearly a dozen other existing chillers, both Trane and YORK models. Upgrades are now being considered for the remaining five chillers on the Round Rock campus.

Cost savings: \$1 million to date; 10% energy reduction year-over-year

Today, the variable-speed drive retrofits are helping the company meet its goal to reduce energy consumption by 10%, which has already translated into \$1 million in accumulated energy savings. The project is also resulting in:

- **Operational advantages:** By replacing the chiller’s original electro-mechanical starter with an OptiSpeed Variable-Speed Drive, the motor starts more slowly. Motor heat is reduced, as is the likelihood of electrical shorts and burn-outs. The chillers can be restarted in as little as three minutes, making quick-turn, emergency restarts possible.
- **Additional power factor savings:** Utilities often charge a premium when a building doesn’t meet minimum requirements for the effective use of electricity. By adding an OptiSpeed Variable-Speed Drive, most utility power factor requirements are met.

Environmental savings: An added incentive

The variable-speed drive retrofits are also helping this customer make good on its commitment to minimize the impact of its operations on the planet. To date, the project has resulted in energy savings of more than 11 million kWh and its impact to CO₂ emissions is equivalent to taking more than a thousand cars off the road or planting nearly 1,200 acres of pine forest. Plus, with the planned installation of additional VSDs on chillers at both the company headquarters and a satellite campus, even more extensive emission reductions will be achieved.

In the meantime, the installation has become an Austin-area showcase for the benefits of YORK Variable-Speed Drive technology. The company has graciously opened its doors to other companies in the Austin, Texas, area to share first hand how VSDs can help organizations meet energy-saving goals.

Extending the benefits beyond headquarters

Within a few years of the Round Rock projects, similar energy-saving initiatives were implemented at a sister site in Austin, where seven more Trane chillers were retrofitted with OptiSpeed VSDs and OptiView panels. Although the project was sent out for bid, Johnson Controls was awarded the contract because of the team's demonstrated expertise – and the results it helped the company achieve – during the Round Rock implementation. Between the two sites, Johnson Controls has currently outfitted a total of 27 chillers with variable-speed drive technology, including 14 Trane units, all of which Johnson Controls maintains under a planned service agreement.

PROJECT SNAPSHOT

Square Feet: 4.5 million

Service Solutions:

At Round Rock Headquarters:

- 20 water-cooled chillers
 - 15 mounted OptiSpeed Variable-Speed Drives with OptiView Graphic Control Centers (eight YORK and seven Trane units)
 - Refrigerant orifice bypass and other chiller modifications to allow more efficient chiller operation
 - Five YORK with Millennium panels slated for future upgrade
- Strategic modifications to central plant control to minimize overall plant power consumption
- Planned service agreement on all 20 chillers and Metasys building management system

Energy Savings:

- \$1 million to date

ROI:

- Planned simple payback: 36 months
Actual payback shortened to just over two years.

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