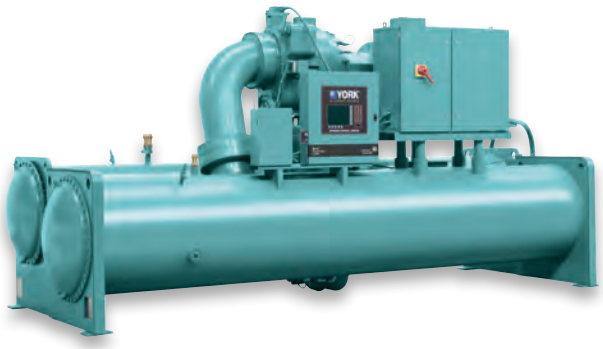
Reach your potential. Start by partnering with the ultimate in real-world performance.



YORK®
BY JOHNSON CONTROLS

LOOK TO THE LEADER

to advance beyond conventional limits

Hot or cold, humid or dry – your facility must handle the challenges of your particular climate. In fact, even within your specific climate zone, you see variations during days, months, and seasons that create your facility's distinct, real-world operating conditions.

Your facility's challenges are unique and each day is different, whether your installation is in Moscow, Shanghai, Rio de Janeiro, or Dubai; whether your facility is a school, hospital, high rise building, or data center.

That's why we created a centrifugal chiller system that can handle your project's unique variables – YORK® YK Centrifugal Chiller from Johnson Controls. Our chillers deliver the ultimate in real-world performance thanks to an exclusive combination of benefits:

Lowest Total Cost of Ownership – Lower installation, operating, and maintenance costs with system design choices that pay off in less than **1 year**.

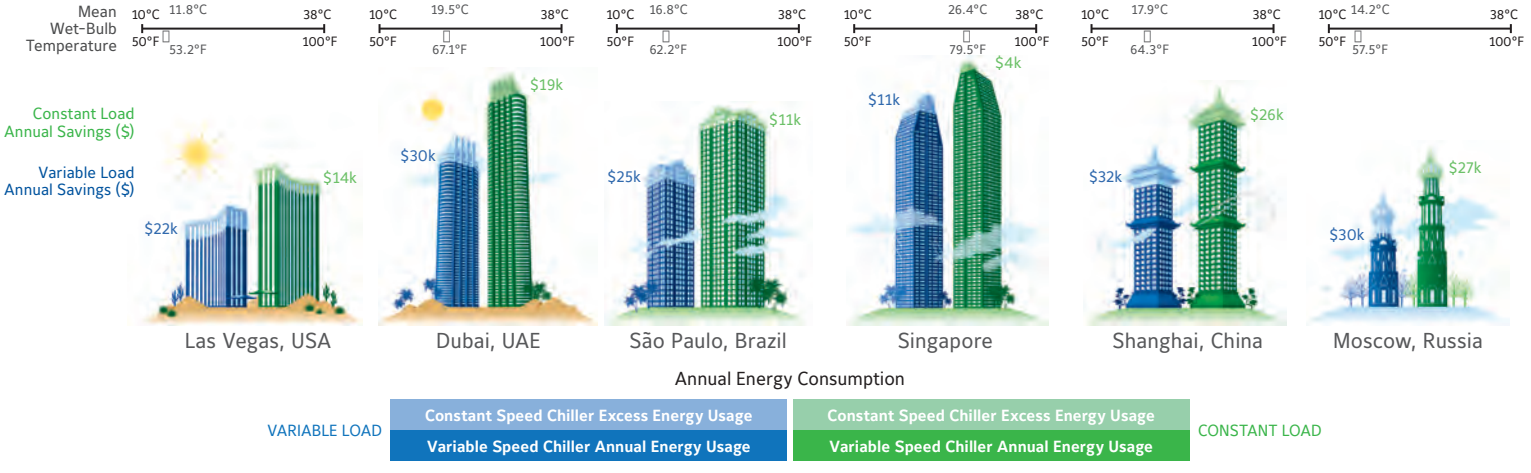
Advanced innovations for unrivaled real-world performance – To build a whole system that is greater than the sum of its parts, we engineered an unprecedented array of innovations into an integrated design that delivers superior performance. Competitive chillers may use a few of the same type of components, but only YORK offers this level of innovation, including our own chiller-specific variable-speed drive. The result: efficiencies as low as **0.20 kW/ton (17.6 COP) while running** in weather conditions other chillers can't tolerate.

Leading sustainable chiller design – HFC-134a refrigerant with no phase-out date and **30% lower** refrigerant charge.

Proven experience in applications, service, and support – From building the world's first ice-making machine in 1895 to introducing the first chiller-specific variable-speed drives in 1979, **YORK experience spans over 130 years and more than 100 countries**. By combining the highest level of application engineering support, controls software programming expertise, and mechanical system and building automation system support, our team has industry-leading resources to handle your unique challenges.

Learn how our real-world performance will give your project the ultimate advantage.

Annual energy consumption in real-world conditions



From Las Vegas to Moscow, YK chillers can take advantage of off-design conditions to save energy for comfort cooling applications with variable loads—even for data centers with constant full load. That's because the Adaptive Control Logic of OptiSpeed™ variable-speed drive (VSD) maps exact performance curves at every condition to minimize speed and still deliver the required cooling capacity.

Data is for a 500 ton (1760 kW) chiller operating at 44°F (6.67°C) leaving chilled water temperature and design condenser water temperature based on the maximum wet-bulb temperature for the particular city plus a 7°F (4°C) cooling tower approach and an electricity rate of $0.10 per kWhr. Savings will vary depending on conditions and electricty rates. For example, electricty rates in Singapore could be as much as $0.30 per kWhr leading to savings that are triple those displayed on the graph.

A TOTAL COST OF OWNERSHIP so attractive it turns your BOTTOM LINE INTO A SMILE

All your direct and indirect costs add up over a chiller's lifetime, which is why it pays to consider your Total Cost of Ownership.

That's why we based our YK chiller design on the total system, rather than a single technology. The benefits show up across your entire bottom line – lowering your installation, operating, and maintenance costs without short-changing your comfort or peace of mind.

Lowering installed cost with a selection that's right for you

"Right-sizing" your chiller selection means you reduce your installation costs right from the beginning. The YK chiller has virtually infinite combinations of heat exchangers, gears, and open-drive motors that deliver the exact required capacity, minimizing the need for a costly step up to a larger-size chiller package.

Employing a variable-speed drive (VSD) designed specifically for YK chillers means fewer internal components in the VSD to create the optimal balance between cost and performance. Engineering and factory-mounting our own OptiSpeed™ VSD provides unparalleled economies of scale.

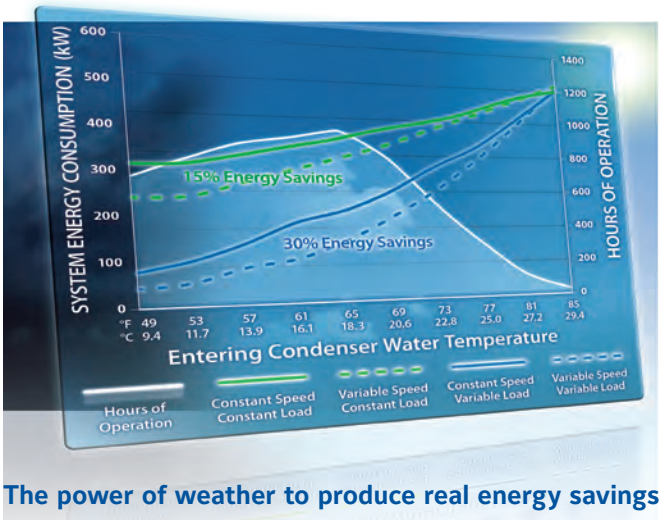
Commissioning costs are minimized due to faster startup and control/building automation system (BAS) integration, which includes programming, hardware, and software that are installed and configured at the factory.

Further savings come from a "free cooling" alternative that significantly reduces or completely eliminates the cost of purchasing and installing an extra heat exchanger loop.

Finally, HFC-134a is the environmentally friendly, chlorine-free refrigerant. While that's great for shrinking your facility's environmental footprint outside, HFC-134a also reduces the physical footprint inside with thermodynamic properties that enable a smaller compressor and shells to reduce rigging and material costs.

Lowering operating costs with real-world energy efficiency

In the real-world, nearly 99% of a chiller's time is spent at off-design conditions. That's when colder weather conditions can reduce compressor workload by lowering the entering condenser water temperature (ECWT). The ability of YK chillers to take advantage of ECWT as low as 50°F (10°C) reduces compressor speed at off-design conditions. This helps deliver up to 30% more annual energy savings than fixed-speed chillers, regardless of how much time the chiller spends at full or part load.



The power of weather to produce real energy savings

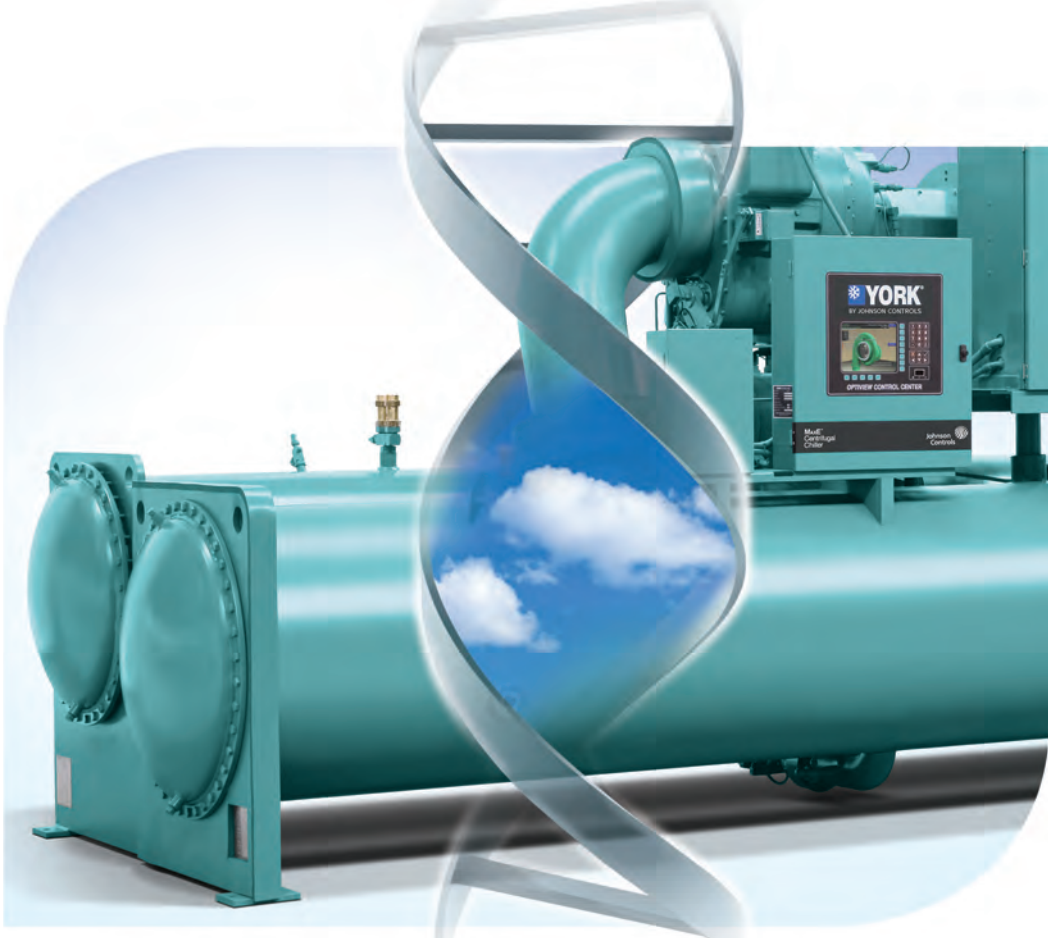
About 99% of the time, weather conditions are cooler than the outdoor temperatures for which the chiller was designed. These "off-design" temperatures allow YK chillers with OptiSpeed™ VSD to slow down even at full loads and use 15% less electricity than conventional fixed-speed chillers. And with variable building loads, energy savings increase up to 30%.

Lowering maintenance costs by design

The open-drive motor never comes in contact with refrigerant. This feature practically eliminates the risk that, in the unlikely event of a motor burnout, the whole system will be contaminated. This negates the need to tear down and clean out the entire system.

HFC-134a refrigerant has no phase-out date allowing for lifetime chiller operation without refrigerant uncertanties. This makes future refrigerant availability a non-issue.

The YK chiller is at lower risk for wear and tear due to OptiSpeed VSD, which eliminates in-rush current to avoid overheating and wiring/insulation breakdown, resulting in even longer motor life.



The only centrifugal design BUILT WITH SUSTAINABILITY in its DNA

You benefit from chiller technology that has reached the top of its class, because it delivers all the advantages of variation and natural selection.

In fact, we inspired the evolution in modern chiller design by pioneering the use of all commercially viable refrigerants in the widest range of chillers. Our goal was and always will be to let customers, not a marketing agenda, decide the most viable chiller design.

Dedicated to being a good customer steward

We continue to protect customers from the trade-offs of gaining efficiency at the expense of reliability. We listened and standardized on HFC-134a, a chlorine-free refrigerant with zero ozone depletion potential (ODP) and no Montreal Protocol phase out date. Today, HFC-134a is the world's

most popular refrigerant, produced in large quantities for many industries and a proven performer in thousands of chiller installations worldwide.

Dedicated to minimizing total climate impact

We are mindful of and account for a refrigerant's global warming potential (GWP). Only 2% of GWP is related to refrigerant emissions in the atmosphere, known as the "direct effect." The remaining 98% is due to greenhouse gases emitted by utilities when generating power for the chiller, known as the "indirect effect."

Committed to minimizing GWP direct effect

YK chillers have a highly efficient shaft seal with built-in monitor which ensures refrigerant stays inside the chiller. Because HFC-134a operates slightly above atmospheric pressure, outside air containing non-condensable moisture cannot enter the chiller, eliminating the need for a purge unit to evacuate water vapor and refrigerant into the atmosphere. All these YK features lower the direct effect, which earns points under the Leadership in Energy and Environmental Design® (LEED) program for Enhanced Refrigerant Management (EAc4).

EPA Climate Protection Award

The ground-breaking innovation and energy savings of YORK electronic variable-speed technology for chillers were recognized in 2005 by the prestigious U.S. Environmental Protection Agency (EPA) Climate Protection Award.

3 = YEARS OF CO_2 SAVINGS

6,000,000 Trees*
33 Square Miles*
Growing enough trees to fill the island of Jamaica

Making progress in shrinking footprints

Saving 3 million metric tons of CO_2 annually

*** Based on U.S. E.P.A.'s Greenhouse Gas Equivalencies Calculator**

Minimize indirect effect by simply using less electricity

YK systems with OptiSpeed VSD are 15% to 30% more energy efficient in the real world than chillers optimized for theoretical full load efficiency. That additional efficiency is equivalent to cutting CO_2 emissions by over 400,000 tons per year. That's why, in many cases, YK chillers can earn LEED points for the Optimize Energy Performance (EAc1) credit.

INNOVATION that dials in the potential of real-world PERFORMANCE

You want to produce more cooling from less kW. By looking into our thought processes, you'll see why the YK design gives you a whole new perspective into what a chiller can do.

Reduce energy costs with variable-speed innovations

It is impossible for chillers with an off-the-shelf VSD to attain optimum energy performance. For this reason, we developed our own OptiSpeed VSD technology specific to chillers that takes unique advantage of variables in real-world operating conditions. OptiSpeed VSD includes chiller-specific capacity control logic to monitor continuously chilled water temperature, hot gas temperature and pressure, motor speed, and other variables. By actually learning how the chiller operates and mapping exact performance curves at every condition, the YK chiller always runs at the most efficient speed while delivering the required cooling capacity. Our control interface empowers you with intelligent plant-operating strategies to add to your energy savings.

Run smarter with a full-color control panel for operators

Think of the OptiView™ Control Center as your on-demand chiller expert; a full-color, interactive display with over 100 setpoints, readouts, alerts, reports, and trends at your fingertips. You're in total control and able to make fast, confident decisions to save energy or fix an issue to

enhance chiller performance. Use the OptiView Control Center panel on its own or integrate it with a BAS interface. It operates seamlessly with Johnson Controls Metasys® building management system or any other major communication protocol.

Limit interruption with the fastest restart

If electrical supply to the chiller is ever interrupted, the Quick Start feature restarts and reaches the specified chilled-water temperature faster than other centrifugal chillers. This is especially important for mission-critical cooling applications. In addition, reaching setpoint faster enables the use of smaller buffer tanks, which further reduces installation costs.

Improve your neighborhood quietly

During nighttime hours or other off-design times, a typical centrifugal chiller gets loud. That's why the YK chiller combines innovative OptiSound™ Control and OptiSpeed VSD to minimize gas-flow disruptions that cause noise. Plus, the chiller's extended operating map allows the system to operate under conditions that would cause other chillers to stall and surge.

Optimize heat exchangers for peak efficiency and endurance

We squeeze more performance into our heat exchangers by using advanced tube alloys and cutting-edge enhancements to improve heat transfer through the tube walls. In fact, our proprietary falling-film evaporator boosts heat transfer and reduces refrigerant charge by as much as 30% compared to conventional designs. We also strengthened the tube array with skip-fin intermediate tube supports. This technique allows thicker walls at critical locations to withstand vibration and cleaning.

Actual Optiview™ Control Center screens.

Engineer a compressor that goes with the flow

To handle high-velocity refrigerant gas, we use precision-balanced, high-strength aluminum alloy with backward curved vanes in a shrouded impeller design. These are features that provide smoother thrust and superior aerodynamics over unshrouded impellers.

Withstand lifetime wear and tear

Specially engineered helical gears with hardened crown teeth ensure even load distribution and quiet operation. The impeller shaft is supported by insert radial sleeve bearings and hydro-dynamic thrust bearings using an oil film, oil pressurized design that prevents metal to metal contact. Tear down for bearing replacement is virtually never required on a YK compressor.

IMMERSED in EXPERIENCE

that brings you real performance

You can't afford to risk your building being somebody's beta test site. Trust the brand that built the world's first ice-making machine in 1895, and the first variable-speed-drive chillers in 1978.

A track record that keeps you ahead

1885 — First commercial ice-making machine in history

1900

1924 — First air-conditioned office building

1925

1935 — First single-room air conditioner in the United States

1950

1958 — First completely factory packaged centrifugal water-cooled chiller

1978 — First variable-speed-drive chiller

Today, the legacy of YORK innovation extends to an installed base of YK chillers with OptiSpeed VSD that spans tens of thousands of installations providing millions of refrigeration tons of cooling in over 100 countries – real-world experience you can rely on for your application.

Count on a leader in technology for a competitive advantage

From cooling the deepest gold mines in South Africa, to the tallest high rises in China and the UAE, Johnson Controls has the engineering expertise to create the system configuration and operating routines to satisfy your unique objectives. The result: optimum performance now and throughout the lifecycle of your installation. These results create comfortable environments around the globe for YORK chiller owners from the largest university campuses of Saudi Arabia, to the finest watchmaking facilities in Switzerland; from the highest storage capacity data centers in America, to the largest fish farms in Chile.

Whether you're cutting energy consumption, reducing noise, improving system monitoring and control, or shrinking your facility's carbon footprint, count on us for the technological expertise to satisfy your priorities.

Keeping you running at your peak – every day, everywhere

YORK chillers are designed to provide the ultimate in serviceability, which begins in the world's largest test facilities where innovations are nurtured and performance is proven time and again. Then in daily operation, the need for service is minimized due to stable chiller operation over a wider operating map along with advanced controls and components that practically run the chiller in "autopilot." Serviceability continues for a lifetime with open-drive technology and infinite bearing life design that never requires a system teardown.

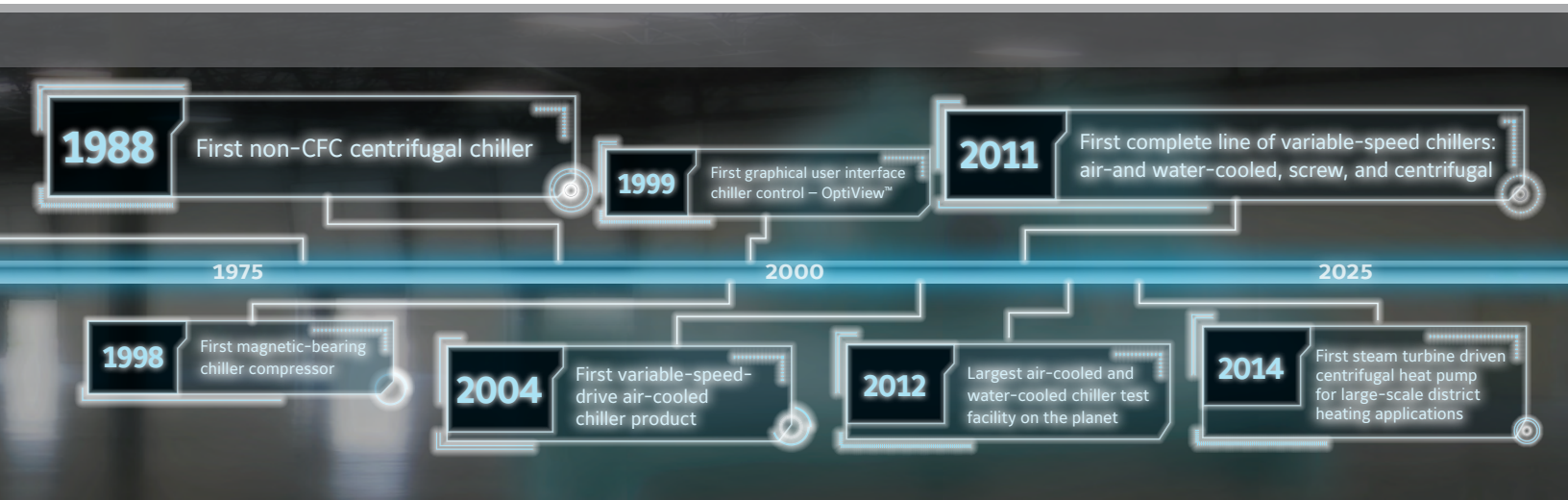
Leading experts in service help you be your best

If service is ever needed, you can count on Johnson Controls. With over 15,000 technicians operating from 500 branch offices in 150 countries, we're the world's leading provider of HVAC equipment, services, and controls. We can ensure your equipment always performs at its full potential. Your local Johnson Controls team offers on-site training and extended service warranties that safeguard system performance and minimize downtime.

Yesterday. Today. Tomorrow.

In a changing world, only YORK YK Centrifugal Chillers combine the lowest Total Cost of Ownership with the most sustainable, efficient, and serviceable design; all delivered by a world-class partner equipped to provide ultimate system performance for a lifetime.

Total Cost of Ownership | Sustainability | Innovation | Experience



Keeping you running at your peak – every day, everywhere

Taking control to a whole new level…

Our Metasys® building management system gives you more control and easier access by incorporating your chiller's OptiView™ Control Center into a building automation system and information technology platform. Plus, our Panoptix® solution simplifies the complex process of collecting real-time data to give you full insight into building and system operation on any wired or wireless internet-connected device.

…and securing your entire facility

Johnson Controls building security services and fire safety solutions can help you achieve comfortable, safe environments that protect people and secure assets. We design and implement advanced security systems that deliver simplicity of operation, enhanced effectiveness, and cost-effective protection.

Learn how the ultimate centrifugal chiller system can perform for you at **johnsoncontrols.com/chillers** or contact your nearest Johnson Controls branch office.

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