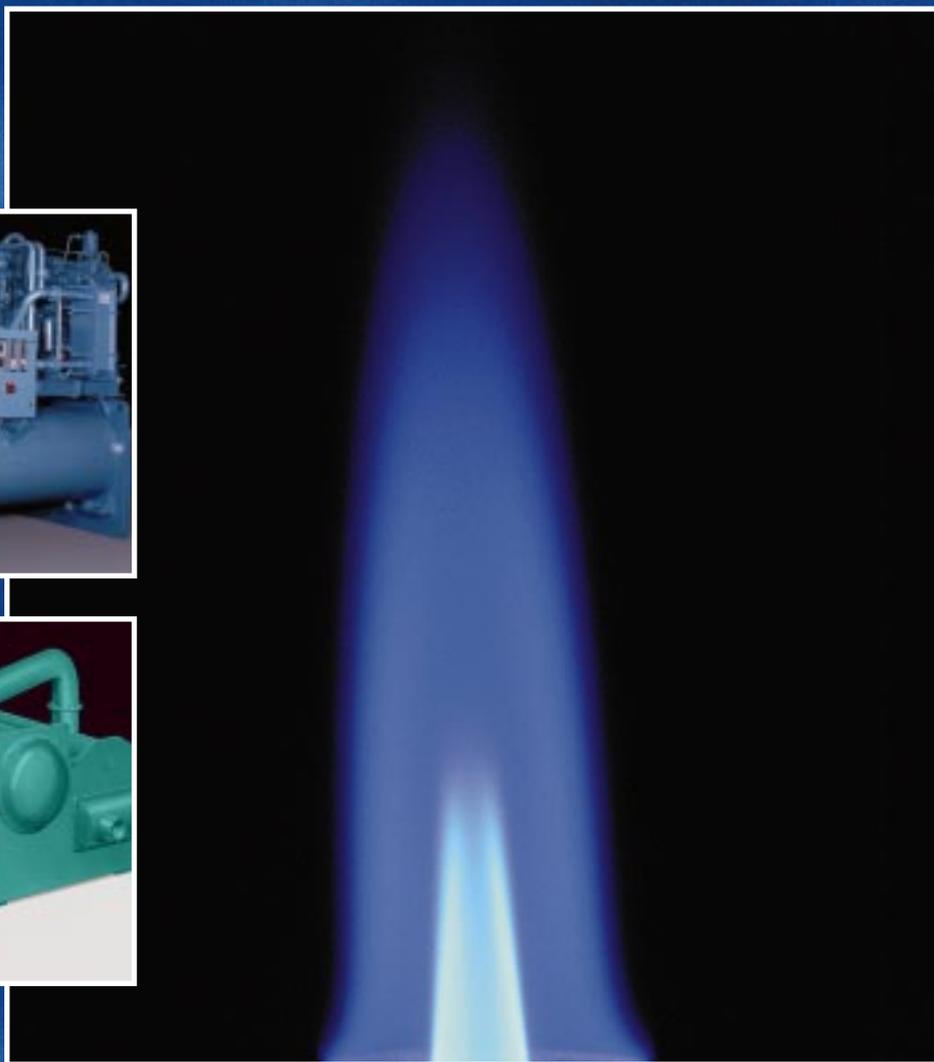


# **YORK<sup>®</sup> Millennium<sup>®</sup> Gas Engine Drive Chillers**





# ***The natural alternative to expensive electric cooling***



YORK presents the Millennium® Gas Engine Drive (GED) chillers, the only natural gas-engine-drive chillers that are designed, tested, serviced, and supported by world-class manufacturers –YORK and Caterpillar. Caterpillar's proven, natural gas-engine design has been integrated with YORK's successful Millennium centrifugal-chiller technology to provide unsurpassed energy savings and reliable operation.

## **Cutting cooling costs by design**

YORK® Millennium GED technology gives you a natural advantage when it comes to reducing energy costs. Instead of using electricity like most chillers, you get the inherent savings that come with using natural gas as an energy source for cooling.

From the outset, you're not paying for the energy losses incurred in the production and transmission of electricity. From the coal mine or wellhead to your chiller, nearly four BTUs of energy must be produced,

burned, converted, and transported to provide the equivalent of one BTU of delivered electricity. Those losses are one of the major reasons why electricity is so expensive.

## **Natural gas conserves dollars and resources**

Unlike electricity, natural gas provides excellent resource-energy efficiency. Only 9% of the source energy is lost in transportation to your chiller – a far more cost-effective and environmentally responsible energy conversion than electricity.

Due to its superior conversion efficiency, natural gas presently costs 75 to 85% less per BTU than electricity. This cost differential is expected to continue in the future, because current natural gas supplies are plentiful, and new gas-recovery technologies are expected to extend supplies by hundreds of years.

The supply of natural gas is plentiful in the summertime, leading many gas utilities to offer special rates and other incentives to encourage use. Another reason why more chiller owners are finding that natural-gas cooling is naturally attractive!

### **Millennium GED chillers offer the most efficient gas cooling.**

YORK Millennium GED chillers are designed to extract the most cooling from every BTU of natural gas. They offer Higher Heating Value Coefficients of Performance (COP-HHV) as high as 1.9 at design conditions, with part-load performance as high as 2.4! This makes a YORK GED chiller an economically attractive alternative to electric cooling in the vast majority of applications.

### **Capitalize on electric deregulation.**

Soon, electric deregulation will change the way you buy energy. While the base price of electricity may decline, prices during peak usage are likely to increase. Prices could go from 1.5 cents per kWh at the low end, up to a range of \$1.50 to \$3.00 per kWh during peak demand.

Unfortunately, air-conditioning is not only the largest energy consumer in most buildings, it operates at peak times when electricity will be most expensive. Plus, uninterrupted electric power will carry an additional premium price – a real concern for some markets, such as hospitals and manufacturing. Consequently, control of peak usage will be just as important as before, if not more so, making gas-cooling technology even more attractive.

Bringing a YORK Millennium GED chiller on-line is a very attractive alternative to operating an electric chiller. It cuts

expensive kW usage and overall electric usage by reducing electric energy consumption at peak times. You can count on a YORK GED chiller alone, or as part of a hybrid plant, to play an important role in minimizing your chiller plant's energy costs.

### **Real-world energy performance realizes real-world savings.**

No competitor can match YORK Millennium variable-speed technology used in our GED chillers to provide real-world energy performance. Real-world energy performance is the combined performance at all operating conditions. Since chillers operate nearly 99% of the time at off-design conditions, off-design performance is the major factor in the energy-savings equation.

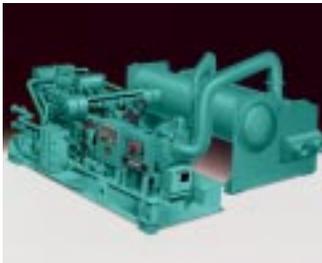
YORK uses exclusive variable-speed technology designed especially for centrifugal chillers. Combining variable-speed technology with the gas-engine drive, the chiller and engine provide optimum performance at all operating conditions.

YORK single-stage centrifugal compressors are designed for superior off-design conditions. In fact, utilizing low-temperature condenser water, down to 55°F at design condenser flow, the HP/TR requirement is decreased while the cooling capacity is increased. The result of the variable-speed operation is maximum energy savings, while reducing wear on the driveline to provide maintenance savings as well.

Several heat-recovery options may also be utilized to further reduce your facility's energy consumption. The GED chiller's engine-jacket heat and exhaust heat can be recovered individually or in combination for many thermal applications. Thus, a system COP-HHV as high as 2.3 can be realized.



# ***Powerful choices for a flexible and reliable cooling solution***



**YORK Millennium YG Chiller**



**YORK Millennium YB Chiller**

## **Flexible design to meet your specific needs**

Only YORK® offers the advantages of GED chiller technology in 350 through 2,100 TR capacities. The established YG product line provides over 80 shell and compressor combinations to tailor the chiller design to your requirements. For additional flexibility, YORK has added the completely factory-packaged YB chiller for lower capacity applications. The YB chiller offers the overall footprint of an electric chiller, while providing the advanced variable-speed technology and unprecedented energy savings of its parent, the YG chiller product line.

## **The new addition: packaged to save space, plus installation time and money**

The new YB GED chiller provides the reliable operation you expect from YORK gas-cooling equipment, all inside an electric chiller's "footprint." In fact, the YB unit takes up the smallest area in its class. A rugged steel frame on top of the tubesheets supports the engine above the evaporator/condenser shells. The chiller measures 7-feet, 2-inches wide to fit through docking bay doorways. This size not only minimizes building modifications, but also saves transport costs by fitting on one flat-bed truck or on one overseas flat-truck container. On site,

you save space and preparation cost by using one pad for the entire unit.

Completely factory-packaged, the YB chiller saves field labor since each unit is piped, wired, pressure-and-leak tested, and nitrogen-charged before shipment. Like its YG parent, the YB chiller comes with single-point power connections. Water connections are also simplified, because the engine-cooling water is factory-piped directly to the condenser-water nozzles. That's it. No other gas-engine-drive chiller is quicker, easier, or less expensive to install.

### **Built to meet industrial demands**

The YB and YG product lines let you take advantage of YORK's expertise in building chilled-water systems and Caterpillar's proven gas-engine technology. YORK GED chillers have been specifically designed by YORK and Caterpillar engineers to meet and exceed the demands for gas cooling.

Caterpillar natural-gas engines utilize a diesel-derivative engine design. Block, cylinder, and piston strength are far superior to automotive engine designs, so you can count on a long, useful life.

Caterpillar has been continuously producing industrial-grade, natural-gas engines for over 50 years. Thousands of engines have been installed to provide a low cost, dependable alternative to traditional forms of power. Today, efficient Caterpillar natural-gas engines are the power of choice in gas-cooling applications.

### **Single-stage compressors for reliability**

Millennium® GED chillers utilize field-proven, YORK single-stage centrifugal compressors. Designed with fewer moving parts and straight-forward, efficient engineering, these compressors have an enviable track record. Combined with the heavy-duty Caterpillar natural-gas engine and the rugged, industrial chiller design, YORK GED chillers are unrivaled in reliability.

### **Tested for assurance**

YORK GED chiller components are tested before and after each chiller is assembled. Every natural-gas engine is

performance-tested at Caterpillar's Large Engine Facility. The YORK centrifugal compressor is air-run, oversped, and hydrostatic-pressure tested. The heat-exchanger shells are pressure-and leak-tested. In addition, factory-run testing is available for YG chiller drivelines; factory full-performance testing is available for YB chillers.

### **The most reliable performance backed by the best service**

With every YORK GED chiller, you get the support and resources of two world-class manufacturers – YORK and Caterpillar. You are not tied to the limitations of a regional supplier.

YORK provides single-source responsibility for the GED chiller system. Over 700 factory-trained YORK Service technicians in 100 strategically located offices worldwide handle chiller and controls servicing.

The global network of authorized Caterpillar dealers stands behind YORK to service the gas engine. Each Caterpillar dealer is factory-trained to deliver technical support and over-the-counter availability of genuine Caterpillar parts to keep equipment up and running.

### **Environmentally friendly cooling**

As a result of Caterpillar's efficient engine design, applications that require low emissions can meet federal, state, and local emission requirements, with use of either a lean-burn, low NO<sub>x</sub> engine or an exhaust catalyst.

By using clean-burning natural gas, a GED Millennium chiller produces less CO<sub>2</sub> emissions per ton-hour than an electric chiller. SO<sub>x</sub> emissions (depending on the fuel) are negligible.

All YORK Millennium GED chillers operate with HFC-134a, the CFC refrigerant with zero ozone-depletion-potential. HFC-134a has no phaseout date, unlike CFC and HCFC refrigerants. The bottom line is that a YORK GED chiller provides a safe return on investment year after year. It's the most environmentally acceptable, mechanical-cooling technology available!





# *The right touch for easy and powerful control*



## **The YORK® Millennium® Control Center puts you in control**

The Millennium Control Center brings familiar membrane-switch control to all Millennium chillers. That's why YORK GED chillers are the easiest gas-engine-drive chillers to operate. Not only do you have access to performance information from one easy-to-read display, you also get data unobtainable from other systems without time-consuming collection and analysis.

## **Single panel provides easy operation and troubleshooting**

All monitoring and control parameters can be easily read from a single panel on the large, illuminated alphanumeric display. You'll never have to worry about interpreting special reference codes or struggling to

read imprecise gauge increments. The Millennium Control Center displays messages in plain English, with numeric data available in a choice of metric or English units.

Typical operating parameters that can be displayed include chilled- and condenser-liquid temperatures, refrigerant pressures, oil pressure, oil temperature, operating hours, and number of compressor starts. Also, important engine data such as RPM, percent load, manifold pressure, jacket-water temperature, and oil pressure can be read directly from this same panel.

## **Easily programmed – just push a button**

Control panel buttons are divided into distinct color-coded groups according to function, providing easy access to all chiller



control and monitoring functions. Keys are clearly labeled and amply spaced to avoid “neighbor-key” errors, and each key is dedicated to one function, eliminating confusion.

Essential operating conditions that can be monitored include: leaving chilled- and condenser-liquid temperatures, refrigerant pressures, oil pressure, oil temperature, operating hours, remote-reset temperature, and 7-day schedule for unit start/stop.



### Precise leaving-chilled-water setpoint

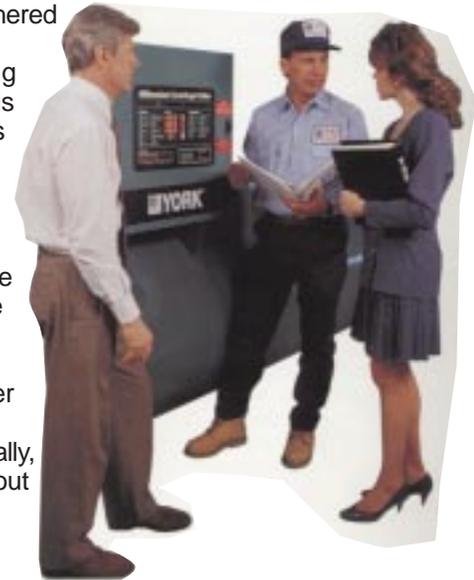
A chiller is designed to produce chilled water at a given temperature. A setting 1°F below design can increase chiller energy consumption by as much as 3%. Instead of laborious trial-and-error adjustments, often accurate to only +/-1°F, the Millennium Control Center allows setting to ± 0.1°F. This level of control virtually eliminates energy waste with the touch of a finger.

### Data logging has never been easier

The Control Center’s comprehensive monitoring capabilities dramatically simplify log reading and recording. All data needed for accurate, detailed logs can be gathered directly from the display panel. Capabilities include logging operating hours into percent-load bins, which is essential for maximizing the benefits of a well-planned maintenance program.

Instead of moving from thermometer to thermometer and gauge to gauge, chiller status can be accessed from one station. Valuable operator time is freed for other important activities.

For added convenience, a printer can be connected to the panel. A printed log can be obtained automatically, at predetermined time intervals, without involving an operator.



### Compatible with building automation systems

The same technological leadership behind YORK GED chillers also provides compatibility with the YORK Integrated Systems Network™, or ISN. The ISN capability can tie together a range of compatible YORK HVAC equipment, can include YORK building automation controls, and can even encompass competitive building automation systems. No other gas-engine-drive chiller comes close to this level of system integration or flexibility.



