YORK® *Millennium*™ Rotary Screw Chillers

with OptiView Control Center

OptiView Control Center for crystal-clear chiller operation

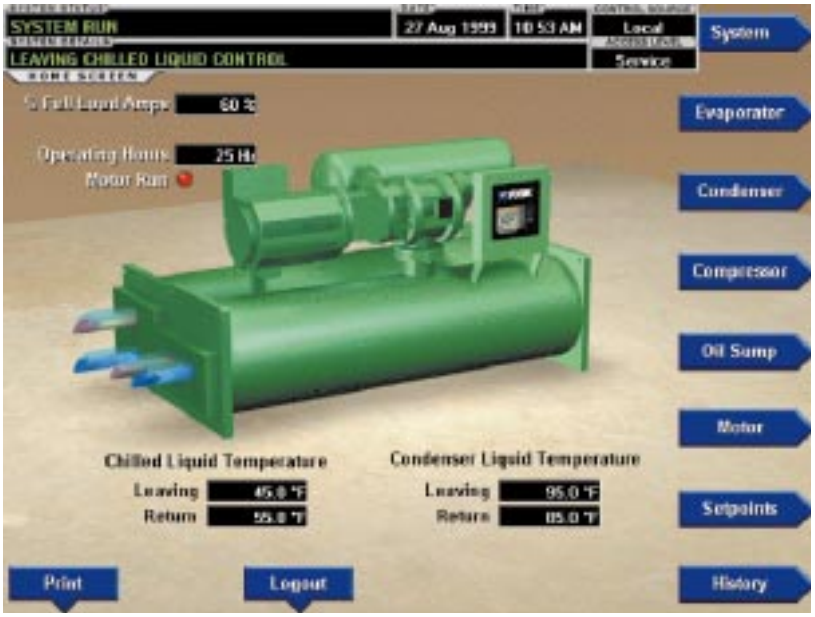
See why the YORK® OptiView Control Center is easier to use

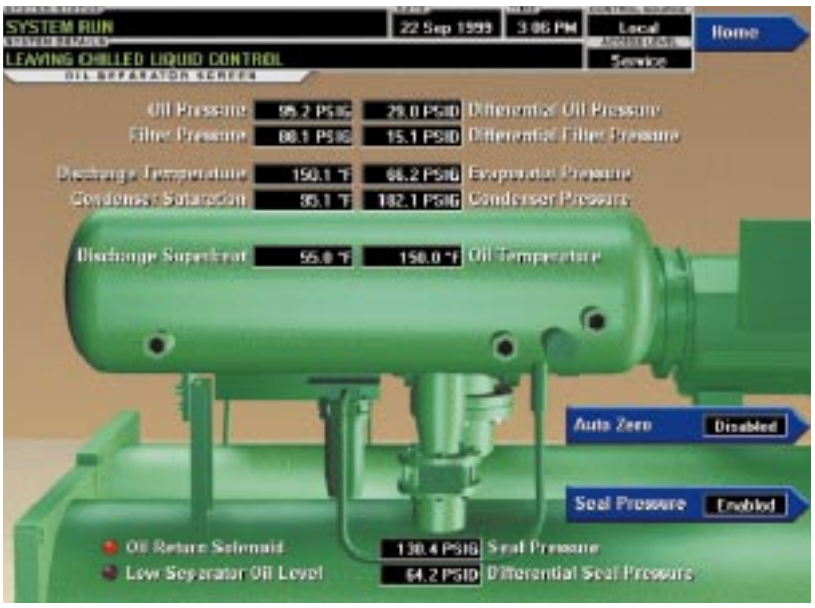
YORK has always pioneered powerful, yet simpler chiller control. We were the first to apply the OptiView Control Center to liquid chillers.

As a result, YORK rotary screw chillers now incorporate the full-color, active-matrix, YORK® OptiView Control Center as a standard feature.

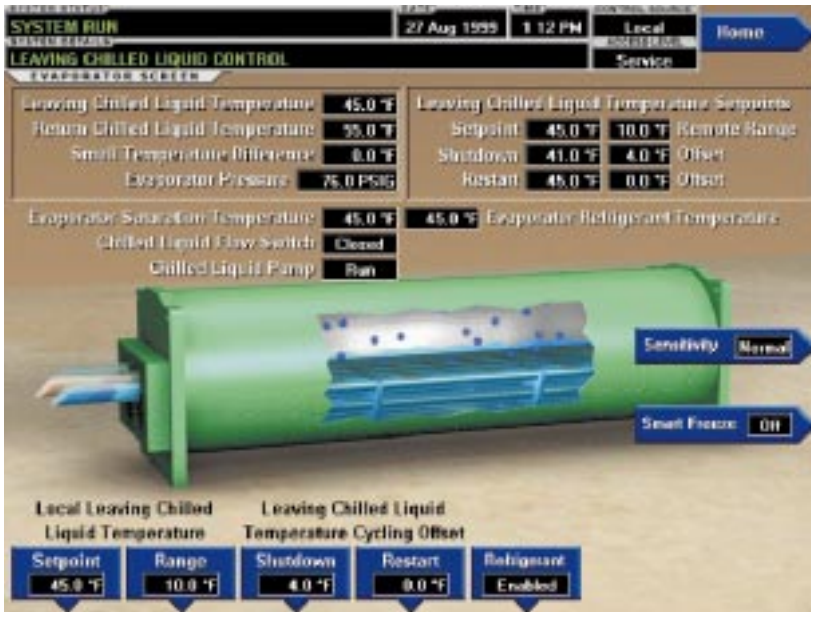
It's an advanced, microprocessor control panel that sets the standard by presenting more data in the most user-friendly way possible. You still get the code-free, plain-language data you're accustomed to from a YORK microprocessor control panel. But now it's even easier to read, thanks to a large, full-color, active-matrix display technology.

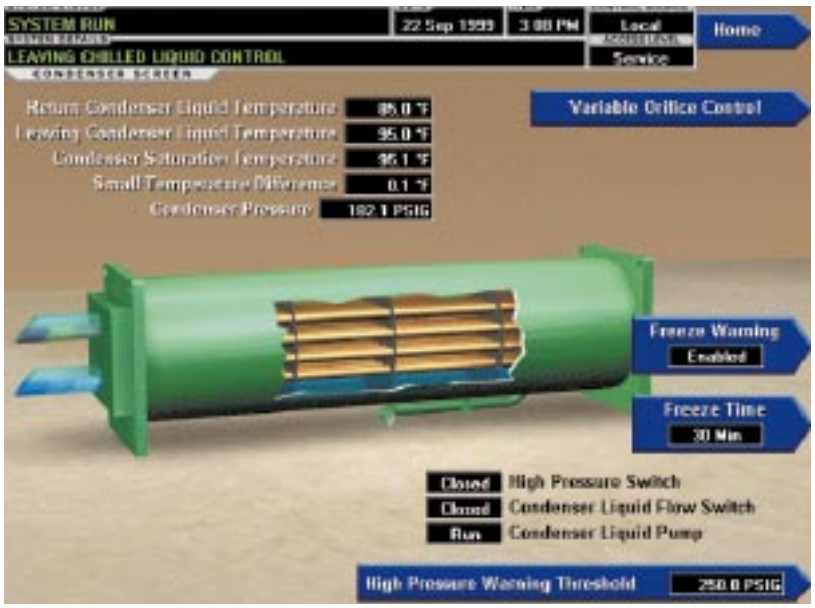
These sample screens demonstrate how easy it is to access and view more useable data. These are typical of the over 35 screens available on the YORK OptiView Control Center.






SYSTEM RUN
08 Feb 2000
4:12 PM
Local
Service
Home
LEAVING CHILLED LIQUID CONTROL
Motor Run
% Full Load Amps
Current Limit Setpoint
Input Power
KW Hours
Starter Model
Phase A
Phase B
Phase C
Voltage
Current
Temperature
Local Motor Current Limit
Pulldown Demand Limit
Pulldown Demand Time
Full Load Amps
Voltage Range
Starting Current
KWH Reset
Open SCR
Enabled
Shorted SCR
Enabled


SYSTEM RUN
27 Aug 1999
1:12 PM
Local
Service
Home
LEAVING CHILLED LIQUID CONTROL
Leaving Chilled Liquid Temperature
Return Chilled Liquid Temperature
Small Temperature Difference
Evaporator Pressure
Leaving Chilled Liquid Temperature Setpoints
Setpoint
Shutdown
Restart
Remote Range
Offset
Offset
Evaporator Saturation Temperature
Evaporator Refrigerant Temperature
Chilled Liquid Flow Switch
Chilled Liquid Pump
Sensitivity
Normal
Small Freeze
Off
Local Leaving Chilled Liquid Temperature
Leaving Chilled Liquid Temperature Cycling Offset
Setpoint
Range
Shutdown
Restart
Refrigerant
Enabled

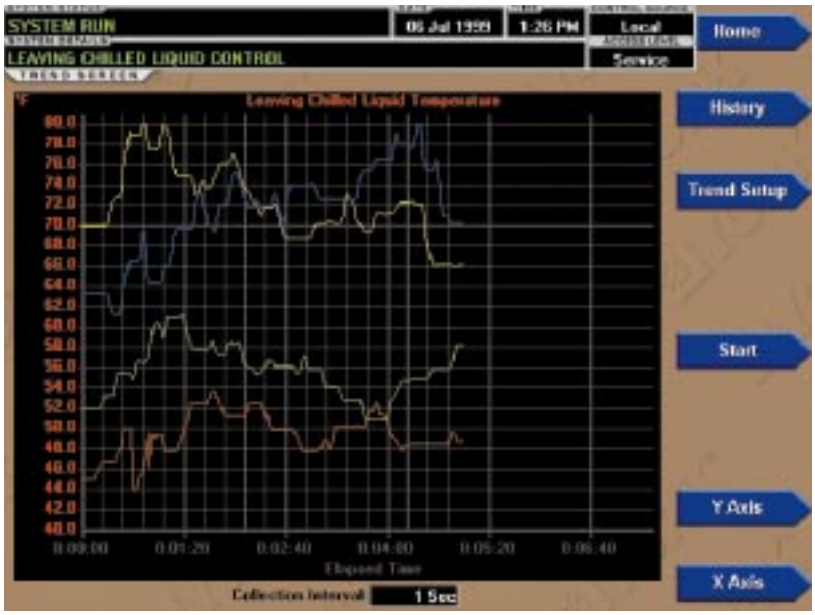

SYSTEM RUN
22 Sep 1999
3:00 PM
Local
Service
Home
LEAVING CHILLED LIQUID CONTROL
Return Condenser Liquid Temperature
Leaving Condenser Liquid Temperature
Condenser Saturation Temperature
Small Temperature Difference
Condenser Pressure
Variable Orifice Control
Freeze Warning
Enabled
Freeze Time
Closed
High Pressure Switch
Closed
Condenser Liquid Flow Switch
Run
Condenser Liquid Pump
High Pressure Warning Threshold

This larger display shows even more data per screen with far less button pushing. And that makes it much quicker and easier to operate your chiller.

To facilitate a higher level of monitoring and control, data outputs are shown in association with illustrations of the appropriate chiller components—a layout that minimizes user confusion. Plus, a “navigation bar” quickly guides you to the level of information you need. For convenience, all data can be displayed in English or several other languages, as well as English or metric units.

Enjoy the advantage of cursor navigation and keyboard input

With the OptiView Control Center, data input is foolproof. A dedicated keypad for numerical input minimizes keystroke errors. Cursor controls for screen navigation make it easy to access all input, control, and monitoring functions.



On-screen trend analysis

The YORK OptiView Control Center full-screen, full-color display allows on-board trending of up to six different values, selected from over 100 items, directly at the chiller control panel. The values and sampling interval are all user selectable via the OptiView Control Center. This flexibility allows the operator to select parameters that are critical for their operation and to trend operating characteristics without a BAS interface and separate monitor.

Get the message – graphically and quickly

Thanks to the large, active-matrix screen, complete, detailed logs can be read directly from the OptiView Control Center. Instead of keystroke after keystroke to gather sufficient data from a small, monochrome LCD screen, a single button reveals an array of chiller information that is quickly seen on a single screen. Data output is provided in precise, digital form. Valuable operator time is freed for other important activities.

Advanced data logging

For convenience, a printer can be easily connected to the control center without interfacing through a BAS system panel. A printed log can be obtained automatically, at predetermined time intervals, without an operator interface. In addition, service technicians can use a portable printer to download information for troubleshooting and repair. All this can also be done while connected to a BAS system.

BAS compatible

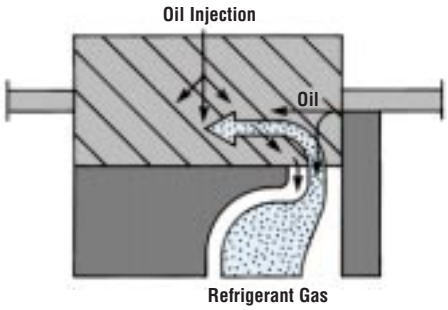
Energy savings and ease of use can be fully realized when the HVAC system is an integrated part of the BAS system. The YORK OptiView Control Center is designed to communicate with most existing control systems on the market today, such as BACnet and others.

Four control options available through security access code

You can rest assured that along with state-of-the-art control, the OptiView Control Center provides advanced levels of security. Setpoints are protected by a user-selectable security access code. A “Remote” mode allows a BAS to implement sophisticated control strategies as a first priority. A “Local” mode provides full control at the chiller control panel. “Operator” opens control software to your commands. And “Service” gives qualified service personnel exclusive access to special functions.

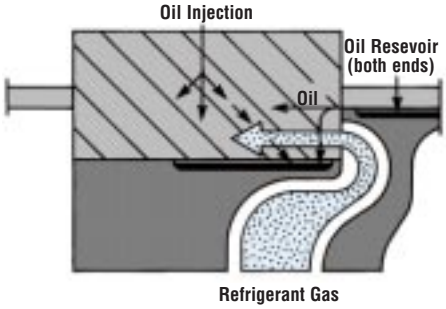
Advanced chiller technology reduces operating costs

Competitive Compressor



Competitive screw chillers rely on a high refrigerant velocity to prevent oil loss to the evaporator which limits unloading capability.

YORK



The Millennium rotary screw compressor offers a greater unloading range because oil cannot drop into the evaporator at low loads.

Precisely machined rotary screws provide highly efficient compression.

Designed for energy efficiency

Until now, many screw chiller designs have emphasized low first costs without offering low operating costs, resulting in chillers with reduced heat exchanger surfaces and inefficient low-load capabilities.

Fortunately for those who pay energy bills, YORK® has taken a different path. The YORK screw chiller carries the name Millennium®, because it has the same excellent operating-cost capabilities pioneered by our Millennium centrifugal chillers.

ARI-certification program

The performance of YORK Millennium chillers is certified to the Air Conditioning and Refrigeration Institute (ARI) as complying with the certification sections of ARI Standard 550/590. Under this program, chillers are regularly tested according to strict ARI standards providing an independent, third-party verification of Millennium chiller performance.

Part-load efficiency plays a very important role in overall chiller efficiency, since chillers spend the majority of their operating hours at part-load. The ARI Certification Program provides an easy method to compare chiller performance at part-load, using the Integrated Part Load Value (IPLV) and the Non-Standard Part Load Value (NPLV). The IPLV and NPLV ratings of Millennium screw chillers are unsurpassed in energy efficiency.

Superior low-load capability

The Millennium screw chiller can transition easily and efficiently from 100% of capacity down to 10%—competitive chillers cannot. The key is a compressor design which prevents oil from leaking into the suction line, regardless of refrigerant gas velocity.

Other screw compressors cannot unload below 25% to 30% of capacity, seriously impairing their low-load efficiency. These designs utilize bottom-suction inlets, and require a high refrigerant gas velocity to prevent oil from dropping into the evaporator.

Matched components maximize efficiency

Actual chiller efficiency cannot be determined by analyzing the theoretical efficiency of any one chiller component. It requires a specific combination of heat exchanger, compressor, and motor performances to achieve the lowest system kW/Ton. YORK® Millennium® technology matches chiller system components to provide maximum chiller efficiency under actual—not just theoretical—operating conditions.

Open motor eliminates hermetic motor energy losses. YORK Millennium close-coupled, open drive design reduces energy usage by 3% to 6% compared to hermetic refrigerant-cooled drives. Air-cooled motors do not reject heat into the chiller system, providing the same cooling capacity for less motor power.

Precise chilled water temperature setting to 0.1°. A chiller is designed to produce chilled water at a given temperature. But until now, the setting of this crucial temperature involved laborious trial-and-error adjustments, often accurate to only +/-1°. And a setting of 1° below design can increase chiller energy consumption by as much as 3%, wasting thousands of kilowatt-hours per year.

The OptiView Control Center eliminates this energy waste. Now you have the capability of setting chilled water temperature to a resolution of 0.1° right at your fingertips. Energy savings through chiller control has never been easier—or more accurate.

High-efficiency heat exchangers. Millennium heat exchangers offer the latest technology in heat transfer surface design to give you maximum efficiency and compact design. Water-side and refrigerant-side design enhancements minimize both energy consumption and tube fouling.

Thermal Storage Control Mode

As electricity markets deregulate around the US and the world, significant operating savings can be obtained by utilizing a thermal storage system. This system design allows owners to run chillers at off-peak times when rates are low, and store the thermal energy for use during peak hours of the day when rates are high. The YORK Millennium Screw chiller maximizes ice build time by utilizing an alternate unloading scheme designed specifically for thermal storage applications. This logic maintains maximum chiller loading where conventional chiller control logic will unload the chiller. The benefit is a shorter chill time and maximization of operation during off-peak rate time.

Take advantage of colder tower water

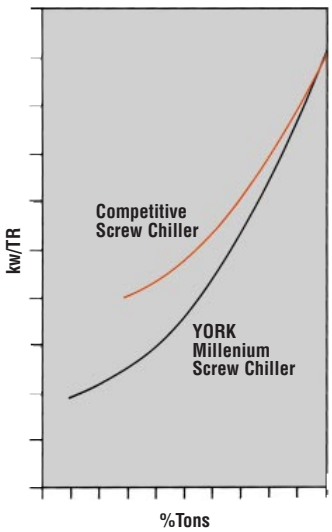
YORK Millennium chillers have been designed to take full advantage of colder cooling-tower water temperatures which are naturally available during off-peak hours. Considerable energy savings are available by allowing tower water temperature to drop, rather than artificially holding it at 70-75°F as required by some chillers.

Advanced warning of tube fouling

No longer must an owner guess when water-side fouling begins to waste energy. The YORK OptiView Control Center provides readouts of saturated refrigerant temperatures. A simple review of the readings will indicate if tube cleaning is needed.

Designed for integration into a building automation system

If you want even more sophisticated control strategies, the OptiView Control Center provides a built-in interface that accepts all types of building automation systems available today. You can take advantage of strategies such as chilled water temperature reset, adaptive stop/start, and special demand schedules quickly and easily.



YORK Millennium rotary screw chillers offer greater energy efficiency.

Proven design provides greater reliability

Reliability from the screw compressor leader

Reliability is built into a YORK® Millennium® screw chiller from the outset. The rotary screw compressor designed by YORK Refrigeration's Frick® subsidiary has been proven dependable in thousands of demanding industrial refrigeration and gas compression applications since the early 1980s. No other manufacturer can match YORK Refrigeration in the number of rotary screw compressors installed worldwide in refrigeration and air conditioning applications.

Slide-valve design reduces wear

The method used to support the capacity-controlling slide valve of a screw compressor can have an important impact on reliability. The Frick compressor has a slide valve built long enough to extend beyond the rotor housing, where the discharge housing supports the valve from underneath. This design means that the valve is kept within a very close tolerance with the spinning rotors, yet never allowed to touch them.

In designs used by less experienced screw chiller manufacturers, the slide valve assembly is confined to an area directly above the rotors. Therefore, it must be supported by the sides of the housing only, a much less secure design which has traditionally been plagued by excessive wear. Critical tolerances in relation to the rotors can be compromised, and, in many cases, the valve may actually hit the high-speed rotors.

Time-proven oil management system

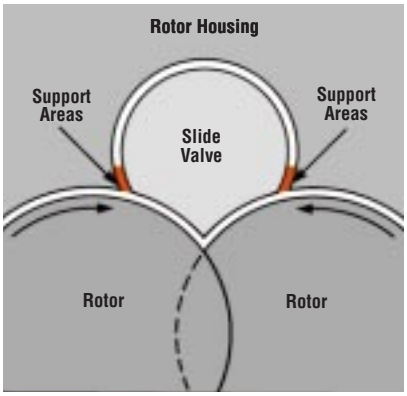
Screw compressors use oil to seal the meshing rotors for efficient compression and to cool the mating parts. Much of this oil becomes entrained in the refrigerant gas. If it is not removed, it will become trapped in the heat exchangers, robbing the compressor of critical lubrication and wasting energy.

The Millennium screw chiller uses a time-proven two-stage oil separator, removing the oil by gravity dropout and by mesh eliminators. In addition, an eductor removes any oil that might migrate to the evaporator, particularly at low loads. System reliability is further enhanced by the refrigerant-cooled oil cooler, which never needs cleaning—a distinct advantage over the non-cleanable, water-cooled oil coolers used on other screw chillers.

Oil reservoir positioned for constant lubrication

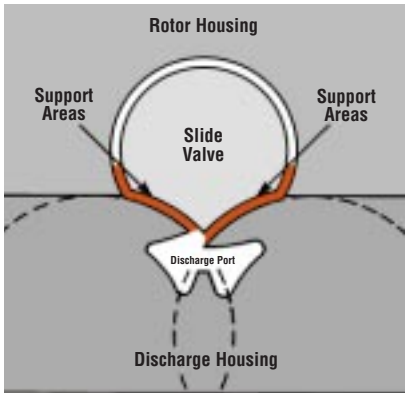
A compressor must have adequate lubrication during startup and shutdown, or it may seize. Less advanced designs

Competitive-slide valve support



Only the rotor housing sidewalls support the slide valve, often resulting in excessive wear and loss of tolerances.

YORK slide-valve support



YORK slide valve extends beyond the rotor housing to where the discharge housing can support the valve from underneath, providing secure positioning and close tolerances.

depend only on residual oil clinging to compressor surfaces to provide lubrication.

Our screw compressor leaves nothing to chance. An oil reservoir located at rotor-bearing level ensures proper lubrication during startup and shutdown.

Open drive design—so reliable, other chillers cost considerably more to insure

Hermetic-motor burn-out can cause catastrophic damage to a chiller, requiring that the entire chiller be cleaned, and the refrigerant replaced. YORK Millennium chillers eliminate this risk by utilizing air-cooled motors. Refrigerant never comes in contact with the motor, preventing contamination of the rest of the chiller.

Insurance companies that offer policies on large air conditioning equipment consider air-cooled motors a significant advantage over hermetic refrigerant-cooled units.

Reliable YORK open-drive motor design eliminates the possibility of a hermetic motor burn out, a catastrophic failure which may contaminate an entire chiller system.

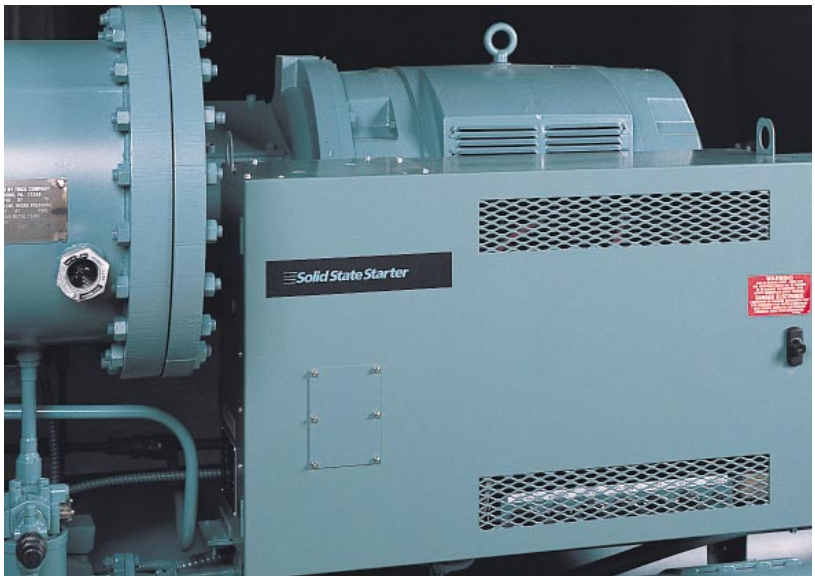
UL and cUL acceptance—your assurance of reliability

YORK® Millennium® chillers are approved for listing by Underwriter's Laboratories and the Canadian Underwriter's Laboratory. Recognition of safety and reliability is your assurance of trouble-free performance in day-to-day building operation.

Electronic starting—smooth and reliable

The electronic design of the optional YORK Solid-State Starter provides the most reliable motor starting system available today. Compare this to old-fashioned electromechanical starters, with mechanical contactors and linkages that can corrode or weld together.

The Solid-State Starter also improves chiller reliability. By "soft starting" the motor, it minimizes the damaging effects of sudden current inrush on the motor/compressor driveline.



The optional YORK Solid-State Starter provides efficient, reliable motor operation.

Flexibility that makes installation easier and faster

Factory packaging reduces field labor costs

YORK® Millennium® screw chillers are designed to keep installation costs low. Where installation access is not a problem, the unit can be shipped completely packaged, requiring only three field installation steps:

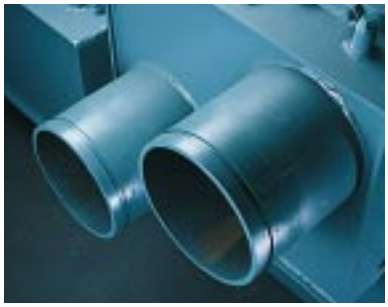
1. Connect power leads to solid-state starter disconnect switch.
2. Connect chilled and condenser water piping. Victaulic grooves require no on-site welding.
3. Connect chilled water flow switch and pump interlocks to control panel.

That's it. No other screw chiller is quicker, easier, and less expensive to install. Most require additional field labor to complete the following extra steps:

No additional field installation labor required

	YORK	Others
1. Additional water piping, valves, strainers for centrifugal chiller purge unit	**No**	**Yes**
2. Additional oil cooler water piping, valves, strainers	**No**	**Yes**
3. Additional solid-state motor starter	**No**	**Yes**
4. Additional thermometers and wells	**No**	**Yes**

Designed to reduce on-site labor



Victaulic couplings eliminate on-site welding or pipe flanging.

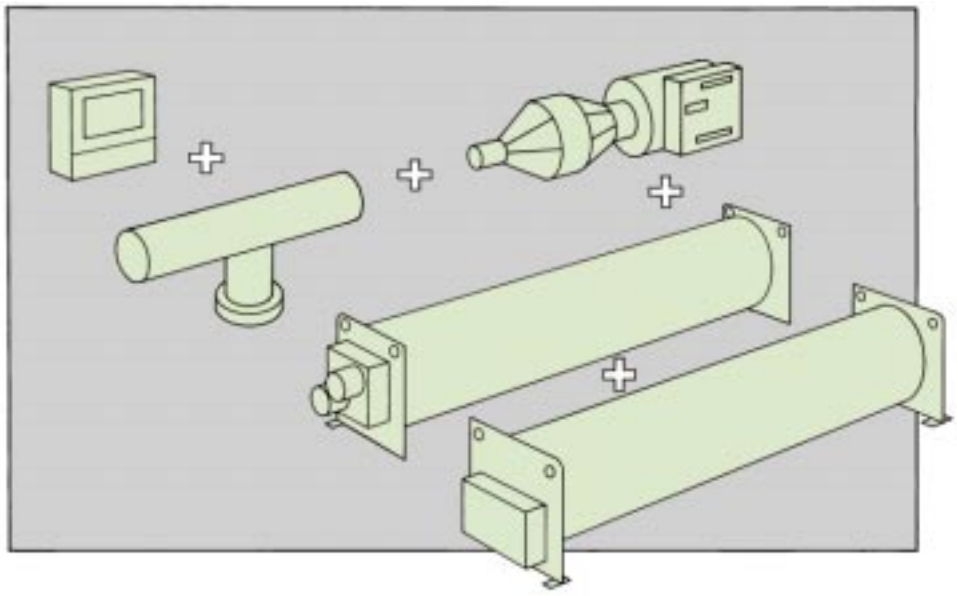
Simple field wiring connections assure quick installation, reliable operation.

Antisweat insulation can be factory applied.

Factory-installed electronic sensors eliminate thermometer mounting on-site.

Flexible packaging for tight fits

If access to the installation site is restricted, the Millennium® chiller can be shipped with the driveline separate from the heat exchangers. For even tighter space restrictions, the evaporator and condenser heat exchangers can also be shipped separately. Virtually all installations can be accommodated without the need for costly and time-consuming modifications to the building structure.



Advanced YORK technology keeps your maintenance costs low

OptiView Control Center keeps you on track

The OptiView Control Center provides complete information on your chillers' operating condition.

Safety-shutdown information includes day, time, and cause of shutdown and type of restart required—in English or several other languages. Color coding of fault messages allows easy determination of chiller status. Yellow messages are shut-downs with automatic restart with no operator intervention required. Red messages are displayed for shut-downs requiring manual restart, alerting an operator that a system check may be required. A software test button even allows you to verify the status of each electronic circuit board in the panel.

The Trending Screen shows changes in motor current, oil temperature and pressure, refrigerant pressures, or water temperatures, which can be valuable indications of developing problems. This capability gives you ample time to take corrective measures before any expensive downtime is incurred.

With the graphic control center, you can see when to schedule routine maintenance in advance of actual need.

No need to reprogram if power fails

The chiller operating system is a non-volatile EPROM, so no power backup is required. A factory-supplied lithium battery (11 years rated life) ensures safe storage of program setpoints without external power to the OptiView Control Center. As a result, restarts follow the parameters you established before power was interrupted.

Open drive is reliable…and easy to maintain

The hallmark of a YORK rotary screw chiller is the open-motor design—a proven configuration that continues on Millennium chillers. Why? On hermetic designs, motor burnout can cause catastrophic damage.

When the motor "goes" in a hermetically sealed chiller unit, the whole system,

essentially, goes with it. Because contamination is spread throughout the closed loop, the entire system will need to be cleaned and overhauled.

You can't afford to take shortcuts. Leaving even minute amounts of contaminants in the refrigerant stream can result in a quick re-occurrence of the burnout, even on a brand new motor.

If the motor is not replaced with a new one, it will have to be rewound and extensively repaired by the manufacturer. Cost of clean-up and motor replacement on an average-sized hermetically sealed system can easily exceed $45,000. Add the potential cost of temporary relocation for employees and tenants while the system is being repaired or the cost of a rental chiller. Plus, time and labor of clean-up administrative and management personnel—which is made more costly with EPA clean-air legislation regulating use and disposal of CFCs. Then, because systems that have had one burnout are more likely to have a re-occurrence, you can expect to see your insurance costs rise.

The air-cooled Millennium motor eliminates this risk. Refrigerant never comes in contact with the motor, preventing contamination of the rest of the chiller. As a result, downtime due to motor burnout is dramatically reduced.

Single-source responsibility

With competitive chillers, service can require shipping components to off-site facilities. With YORK, if any problem occurs, one call to YORK Service takes care of it all. That's because the worldwide corps of YORK factory-trained and factory-certified technicians is near you to help. In the unlikely event that replacement parts are needed, a complete stock is available from YORK.

UL reliability

YORK Millennium chillers are approved for listing by Underwriter's Laboratories for the United States and Canada. This recognition of safety and reliability is your assurance of trouble-free performance in day-to-day operation.

YORK®

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U.S. Olympic Team

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