



November 9, 2009

Matt Dobecka, CPPB
Collin County Purchasing
McKinney, TX 75070

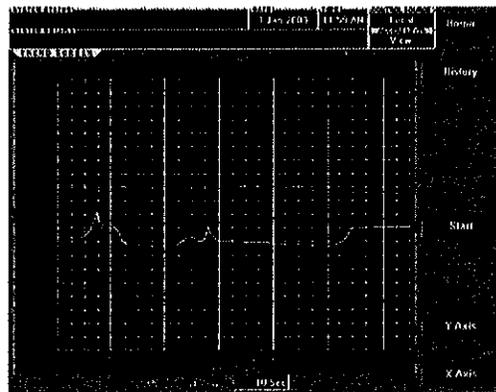
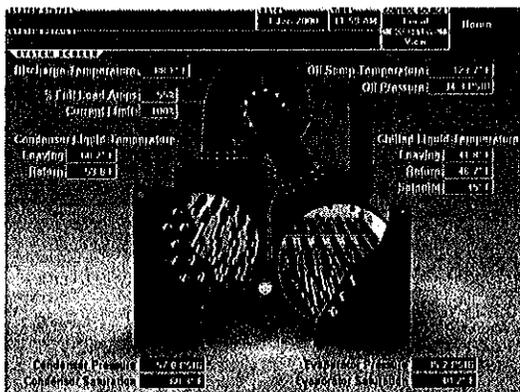
Reference: York 1000-ton Centrifugal Chiller

Matt,

We would like to thank you for the opportunity to submit a proposal for the York 1000-ton Centrifugal Chiller. We have listed below several important items that we feel should be considered in the evaluation process. These items address specific issues related to the York design that provide the end user with a more reliable and user-friendly chiller.

Graphic Control Center

York now offers the most advanced micro-processor control panel in the industry. The Graphic Control Center allows more user-friendly means of obtaining and interpreting data. The large, full-color screen utilizes advanced active-matrix display technology allowing the user to view several different parameters on one screen without having to scroll through a long menu of options as required on a standard 40 character alphanumeric control panel. The graphic screen also allows the user to trend data graphically on the screen to monitor operating performance. For example, many of our customers will trend the approach temperature in the condenser (difference between the leaving water temperature and the refrigerant condensing temperature) to monitor tube fouling. If the approach temperature is larger than the design approach, it is very possible that the tubes are fouled and need to be cleaned. Since tube fouling will reduce efficiency and ultimately result in higher operating costs, this can be a very useful tool. There are many other monitoring capabilities associated with the Graphic Control Panel that can help the operator maintain efficient operation and reduce unforeseen service procedures.



kW and kWh Metering

The new Graphic Control center actually monitors and displays the kW and kWh consumption on the control panel screen. This information allows the operator to track performance based on different loads and entering condenser water to optimize chiller loading for peak chiller plant performance. It also



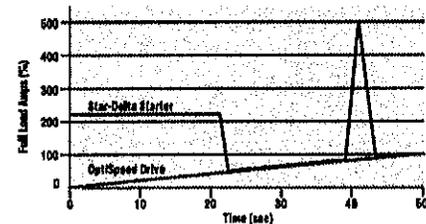
provides a means in which to monitor tube fouling and refrigerant charge. If the kw draw is significantly higher than the design kw at a specific load and condenser water temperature, there is a good possibility that the tubes are fouled, reducing heat transfer performance, or the chiller is low on refrigerant charge. This is only one example of the many monitoring capabilities of the Graphic Control Center that allows the operator to diagnose and prevent possible problems before they occur.

Variable Speed Drive Technology (VSD)

A constant-speed chiller reacts to lower load or lower entering-condenser-water temperature by closing its pre-rotation vanes (PRV), which throttle the refrigerant flow and save some energy. However, as the vanes continue to close, they create frictional losses, which negatively impacts the chiller's efficiency and limit its energy-saving capability. A good analogy is driving a car with the accelerator pedal depressed to the floor while controlling the speed with the brake. Constant Speed Centrifugal Chillers also negatively impact the electrical power factor causing higher electrical fees. Additionally, constant speed chillers do not take advantage of available reduced condenser water temperatures.

OPERATIONAL ADVANTAGES of YORK VARIABLE SPEED DRIVES:

Electro-mechanical starters use a full speed start, with inrush currents reaching as high as 250% of full-load amps. This electrical inrush causes a tremendous heat build-up, and flexing at critical points in the motor windings. Over time, this repeated flexing could damage the winding insulation and eventually cause motor failure. For this reason, a 30-minute cool-down period is mandatory before a constant-speed centrifugal chiller can be restarted. By replacing the electro-mechanical starter with an OptiSpeed drive, the chiller's motor starts more slowly. It never draws more than 100% of its full-load amps. Motor heat is reduced, as is the likelihood of electrical shorts and burnouts. As proof, chillers controlled by an OptiSpeed drive can be restarted in as little as 3 minutes, making quick-turn, emergency restarts possible.



Compared to electro-mechanical starters, OptiSpeed drives reduce current inrush and motor wear.

For further electrical protection, the OptiSpeed drive is designed to reduce electric-current harmonic distortion, which can damage other equipment in the building. As a standard, an OptiSpeed drive reduces distortion to 26%, compared to 80% distortion caused by competitive drives.

While electrical safeguards protect the electrical components of the chiller, the mechanical components benefit from lower operational speeds. Since 99% of operating hours are at less than full-speed, moving parts experience less component-wear, resulting in greater reliability and longer life.

VSDs and York

York has been manufacturing Variable Speed Drives for Centrifugal Chillers since 1975 and has installed over 150 Variable Speed Drive Centrifugal Chillers in the North Texas Area. We recommend Collin County to take advantage of the lower energy costs and the decreased motor inrush accomplished with York Variable Frequency Drives.



Open Drive Design

Operating outside of the refrigerant stream, the open-drive motor does not disturb the refrigerant circuit in the event of motor burnout. This allows the motor to be replaced within a matter of hours instead of weeks in the event of a motor burnout. Hermetic motors on the other hand, which have a 50% higher failure rate than open motors, will contaminate the entire refrigerant circuit if burnout occurs. The cost to replace the hermetic motor and clean the entire contaminated refrigerant circuit can cost the owner thousands of dollars and several weeks of lost productivity due to chiller shutdown.

Reduced Maintenance- Bearing Design

Most chiller manufacturers who utilize hermetic motors require a bearing inspection at certain intervals during the life of the equipment. One manufacturer who produces an R-134A centrifugal with a hermetic motor recommends a five year or 40,000 hour (whichever comes first) bearing and gear inspection on their medium pressure centrifugals. The reason they recommend this inspection is because their bearing and gear assembly is not designed for the life of the chiller. At 1000 tons this inspection would cost approximately \$10,000 per machine. If this is the case, the expected additional costs for a replacement bearing set would be \$15,000 and, if there is gear wear; \$30,000 would be needed to replace the double helical gears. What I have not mentioned is this downtime required to inspect and replace the bearing and gear assembly which could take weeks.

York's bearing and gear design is designed for the life of the chiller. The gear design is AGMA 11-13 compliant and is of the same design that York incorporates into all U.S. Navy submarine chillers. York's bearing design (aluminum bearings instead of the more malleable babbitt bearings) is designed for the 25 year life of the chiller. Further, the most critical bearing in a medium pressure gear-driven machine, the high speed shaft thrust bearing, is monitored by a proximity probe and oil temperature sensor and displayed at the control panel on the York machine. The bottom line is York has a bearing/gear design that is built to last.

Skip-fin Tube Design

YORK chillers utilize the latest, state-of-the-art surfaces, heat exchanger designs and materials to attain new levels of thermal transfer in a compact shell. Enhancements in water-side and refrigerant-side design minimize energy consumption, water pressure drop and tube fouling.

In addition, the heat exchanger tubes have been designed to provide the most reliable long-term operation possible. All **YORK** tubes have plain copper lands (without internal and external enhancements) at the tube sheets and at all intermediate tube supports. This provides a double thickness of copper at these critical support portions of the tube.

All heat exchanger designs are evaluated for tube vibration. The predominant cause of vibration in an evaporator is the violent boiling action of the refrigerant. In the condenser, the source of vibration is from outside mechanical sources (pumps, compressor, etc.). Tube vibration problems are eliminated

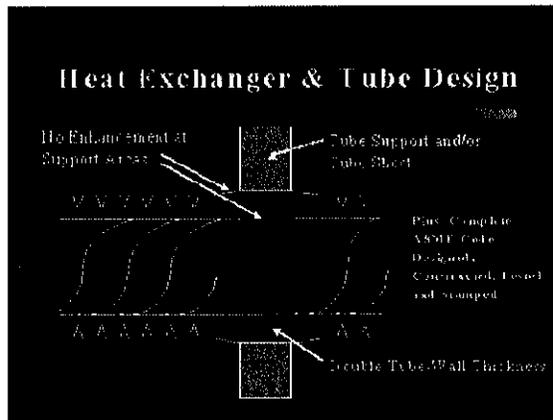
with 1/2" thick intermediate tube supports and/or rolling the tubes into the intermediate tube supports. This conservative design philosophy ensures maximum life from the heat exchangers.



The enhanced portions of tubes are not suitable for support due to the work hardening process in manufacturing the enhancements. Work hardened material is more brittle than the soft annealed copper lands. Tubes having continuous internal and external enhancement at the tube support short change the tube and heat exchanger longevity in favor of a lower first cost product.

The common term, wall thickness or gage, refers to the minimum wall thickness of the tube. This would occur at the enhanced portion of the tube. Wall thickness is measured from the root of the outer enhanced surface to the root of the internal ribbed surface.

A cross section of the tube is shown in the diagram; and the actual wall thickness is tabulated in the following table.



TUBE GAGE	ACTUAL TUBE THICKNESS	
	ENHANCED SECTION	PLAIN SECTION
23	0.025"	0.050-0.053"

I trust that after reviewing these important items you will agree that York offers a superior product that will provide the owner with the most reliable and efficient operation for the life of the chiller. Once again I would like to thank you for the opportunity to submit this proposal. If you have any questions or require any further information please feel free to call me at anytime.

Sincerely,

David Flickinger
 Account Manager
 Johnson Controls
 214-878-3478



November 9, 2009

Matt Dobecka, CPPB
Collin County Purchasing
McKinney, TX 75070

Reference: York 1000-ton Centrifugal Chiller

EQUIPMENT PROPOSAL

We are pleased to provide equipment pricing for the above referenced project in accordance with the standard terms and condition of sale attached to this document. This proposal is in accordance with mechanical plans and specifications issued by Summit Consultants with clarifications as noted herein.

<u>ITE</u>	<u>QTY</u>	<u>TAGS</u>	<u>DESCRIPTION</u>
<u>M</u>			
I	(1)	CH-1000Ton	WATER-COOLED CENTRIFUGAL CHILLER

EQUIPMENT DESCRIPTIONS

I WATER-COOLED CENTRIFUGAL CHILLER

Items Included by Johnson Controls

- Motor, 460 volts, 3 phase, 60 Hz
 - Motor Enclosure: ODP
- Variable Speed Drive, factory mounted and wired.
- Isolation Valves
- Evaporator:
 - Marine Water Boxes, rated for 150 psig water-side pressure.
 - Flanged Connection.
 - Factory Thermal Insulation for Evaporator 1 1/2" inches.
 - Flow Sensors, factory mounted and wired.
- Condenser:
 - Marine Water Boxes, rated for 150 psig water-side pressure.
 - Flanged Connection.
 - Flow Sensors, factory mounted and wired.
- Optiview Graphic Control Panel:
 - Factory Mounted on Condenser (Control panel will be facing the existing York chiller graphic control panel)



- Eddy Current Testing of “MQ” Evaporator and “M3” Condenser.
- Unit Warranty: Optional 30 Month (2 Year) Entire Unit Parts and Labor. (from date of shipment)
- Chiller Start up (PCAT)

Scope of Work

- Receive one (1) new 1,000 Ton York Chiller Model No. YK MQM3 H9 CZG from the York factory and store locally until time of project.
- Form and pour housekeeping pad for new chiller at the location designated per customers drawings.
- Load said chiller and transport to Collin County Central Plant located in McKinney, Texas.
- Unload chiller and set in place on new housekeeping pad per customers drawing.
- Provide and install neoprene isolator pads for each foot of the new chiller.
- Provide and install one (1) LON micro-gateway in the York chiller graphic control panel. (Connection to the EMS by others)
- Provide a York factory trained technician for start up of the York chiller and factory mounted Variable Speed Drive.
- Provide customer training on the new chiller concurrent with the start up.

Items NOT Included

- General Contracting duties.
- Energy Management. (One (1) LON micro-gateway is included with the York chiller)
- Refrigerant monitor or SCBA.
- Providing access for equipment. (Chiller will arrive and be rigged in place as one (1) piece)
- Valves for vents and drains
- Pressure gauges for chilled water lines
- Relief piping to the atmosphere.
- Coordination drawings of central plant.
- Occupancy adjustments after completion of York’s chiller start-up.
- Piping and Wiring.
- Piping Insulation.
- Evaporator Flow/Differential Pressure Switch.
- Condenser Flow/Differential Pressure Switch.
- Permits or fees.
- Performance or payment bonds.

Current Lead Time for the Chiller is twelve (12) weeks from completed paperwork.



PRICING:

All pricing is FOB factory with full freight allowed to jobsite, not including any taxes, fees or storage. Price is valid for 30 days after quotation.

BASE BID PRICE – TWO HUNDRED TWENTY FIVE THOUSAND SIX HUNDRED THIRTY DOLLARS AND NO CENTS (\$225,630.00)

***Please contact your JCI HVAC Sales Representative in regards to our discount option for pre-payment, prior to equipment shipment. ***

Thank you for the opportunity to be of service.

Sincerely,

David Flickinger
Johnson Controls
Account Manager
214-878-3478

CUSTOMER APPROVAL:	
Total Price:	_____
Customer Name:	_____
Signature (*)	_____
Date:	_____
<small>* By signing this proposal, you agree to purchase the bill of material as described in this proposal document, pursuant to the attached standard terms and conditions and for the Total Price documented on the above line.</small>	