

Hill PHOENIX

E X C E L L E N C E

A DOVER COMPANY

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FARM FRESH JOINS EPA'S GREENCHILL PARTNERSHIP

New Stores to Feature Hill PHOENIX Two-Stage Open-Drive Refrigeration Technology

CONYERS, Ga., March 26, 2008 – Farm Fresh, a SUPERVALU Inc. company, has joined the U.S. Environmental Protection Agency's new GreenChill Advanced Refrigeration Partnership, an alliance with supermarket companies in which they pledge to adopt technologies, strategies and practices that reduce emissions of ozone-depleting substances and greenhouse gas emissions. Farm Fresh announced its GreenChill partnership with the EPA at the opening of its new Franklin, Va., store on March 26.



To help meet its GreenChill goals at the Franklin store and at stores across the company, Farm Fresh will employ technology from Hill PHOENIX, a leading designer and manufacturer of commercial refrigeration systems.

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“Farm Fresh is always looking for ways to improve energy efficiency and reduce our impact on the environment while providing customers with a world class shopping experience,” said Jon Perry, director of energy and maintenance for Farm Fresh. “The Hill PHOENIX technology we’ve selected offers benefits for the environment, our stores and our customers.”

Two-Stage Open-Drive Technology

Hill PHOENIX has a wide range of technologies and products that are environmentally sound, including the two-stage open-drive refrigeration system with Carlyle compressors and Toshiba compressor drive motors, which is being utilized by Farm Fresh. An advanced direct expansion (DX) system, it offers an array of benefits for customers looking for an effective and efficient DX alternative. According to Scott Martin, director of sustainable technologies for Hill PHOENIX, the advanced two-stage open-drive refrigeration system provides yet another answer in effective refrigerant management.



“This open-drive refrigeration technology demonstrates our commitment to providing a wide range of answers that address the environmental and sustainability efforts our customers are engaged in across the country. There’s no single answer for all situations and this two-stage open-drive technology is a great alternative with premium energy efficiency.”

According to Martin, the three biggest advantages of the Hill PHOENIX advanced two-stage open-drive refrigeration system are the reduction in refrigerant charge, improved energy efficiency and the overall simplification of the system that results in increased reliability and less maintenance.

Reducing Refrigerant Leak Potential

Reducing refrigerant in the Hill PHOENIX open-drive system is achieved through a variety of system designs that lower the potential for refrigerant leaks.

In the Hill PHOENIX advanced two-stage open-drive refrigeration system, the compressors are key. While open-drive compressors have been around for more than 50 years and have offered solid technology, the industry moved away from them because the seals had the potential to leak. However, new technology incorporated into the open-drive compressor has eliminated many of the problems inherent in the past system. The laser alignment of the compressor and motor to a one mil tolerance helps reduce the potential for a refrigerant leak and reduces the energy consumption.



“With laser alignment, we’re able to get a finer tolerance in lining up the compressors and motors and that means less vibration and energy consumption,” Perry explains. “With less

vibration you not only reduce refrigerant leak potential, but you can operate longer with less wear and tear on the equipment. This results in additional cost savings by reducing system maintenance.”

The open-drive systems at Farm Fresh also have fewer compressors, including a smaller number of connections, refrigerant flow control valves and a minimal use of Schrader valves. The design also eliminates oil separators and reduces the number of oil floats to only two per store.

Another key to reducing refrigerant leak potential is the design of the compressor rooms. At the Farm Fresh store in Franklin, the Hill PHOENIX equipment operates in a completely contained compressor room in which conditioned air provides a controlled space.



“In a typical application, 20,000 cfm of unconditioned air is circulated throughout the machine room to cool the equipment, bringing with it a lot of dirt and causing any refrigerant leaks that may occur to be diluted to the point where refrigerant leak readings are not reliable,” explains Perry. “With the contained room design, we’re able to keep dirt out by using only conditioned air to cool the room. If there is a refrigerant leak, it can be detected immediately at a higher concentration and at a lower leak rate and addressed right away.”

The use of loop piping in the Hill PHOENIX system also lowers leak potential due to the reduced amount of copper piping and fittings required. In a more traditional supermarket refrigeration system, two lines run from the compressor rack to each refrigeration circuit. In a store with 60 circuits, that can mean up to 120 lines, making it harder to identify the source of a leak. In the Farm Fresh loop piping design, only one liquid and three suction lines leave the main system in the machine room and then branch out to the refrigerated cases, saving a tremendous amount of expensive copper and reducing the leak potential.

Reduced Refrigerant Charge

The Hill PHOENIX advanced open-drive refrigeration system also lowers refrigerant charge. The heat reclaim system uses a brazed plate heat exchanger and hydronic pumping system to circulate water instead of refrigerant to the HVAC system. Its roof-mounted vertical surge receiver offers reduced refrigerant charge because it requires less refrigerant than a horizontal receiver for proper operation. Additionally, roof mounting provides natural sub-cooling, especially in the winter. This translates into less refrigerant charge and high energy efficiency for a store. Adds Perry, "In a typical 60,000-square-foot store such as Franklin, we've been able to reduce refrigerant from 4,400 pounds to 2,500 pounds. That's a substantial reduction."

Greater Energy Efficiency

According to Hill PHOENIX, one of the greatest advantages of the two-stage open-drive refrigeration system is energy efficiency. The overall refrigeration system is twenty percent more energy-efficient than a standard DX store. This efficiency is due in part to the high efficiency Toshiba motors used. Ten percent more efficient than any standard compressor motor, they run at 1200 rpm rather than 1750 rpm. Some of the efficiency gain comes from the two-stage low-temp compressors. Two-stage compressors are seven percent more energy-efficient than single-stage compressors. Another aspect of the increased energy efficiency is the fact that with external motors, there is no motor heat that must be removed by the refrigerant.

The hydronic heat reclaim feature also significantly impacts energy efficiency by using the total store thermal heat of rejection (THR), including the store air-conditioning heat of rejection, instead of from one or two compressor systems in a typical store. "By using more of the waste heat taken out of the display cases and air-conditioning and reheating the air or water in the store, we're able to greatly reduce energy consumption," Perry notes.

Simplicity Provides Maintenance Advantages

While a reduction in refrigerant and increased energy efficiency offer cost savings, the overall simplification of the system offers savings as well.

For example, combining refrigeration and HVAC into one system makes it easier for technicians to maintain and service the system. This has been one of the true advantages according to Perry. “Farm Fresh anticipates maintenance savings because it is simpler for mechanics to maintain both the refrigeration and HVAC. The all-in-one system is something they already know,” says Perry. “The troubleshooting you apply on a low-temperature case is identical to troubleshooting for a small A/C unit that runs the pharmacy. The technicians don’t have to do anything different.”



Farm Fresh management also believes that the technological advancements built into this system have improved reliability and provide a long life expectancy. In fact, according to Perry, “The average life expectancy for an open-drive compressor is more than 25 years. Farm Fresh is willing to spend a little more at the time of purchase because the initial cost premium will be paid back due to the substantially lower operating cost.”

Farm Fresh was also sold on the reliability of the system when it considered the life expectancy benefits over typical semi-hermetic systems. In a typical semi-hermetic system, eventually there will be a compressor burn-out, which can turn the oil into acid, a hazardous material. Because the compressor motor is independent from the system in an open-drive refrigeration system, this problem is eliminated. It is an environmental benefit frequently not considered when choosing the use of semi-hermetic compressor systems.

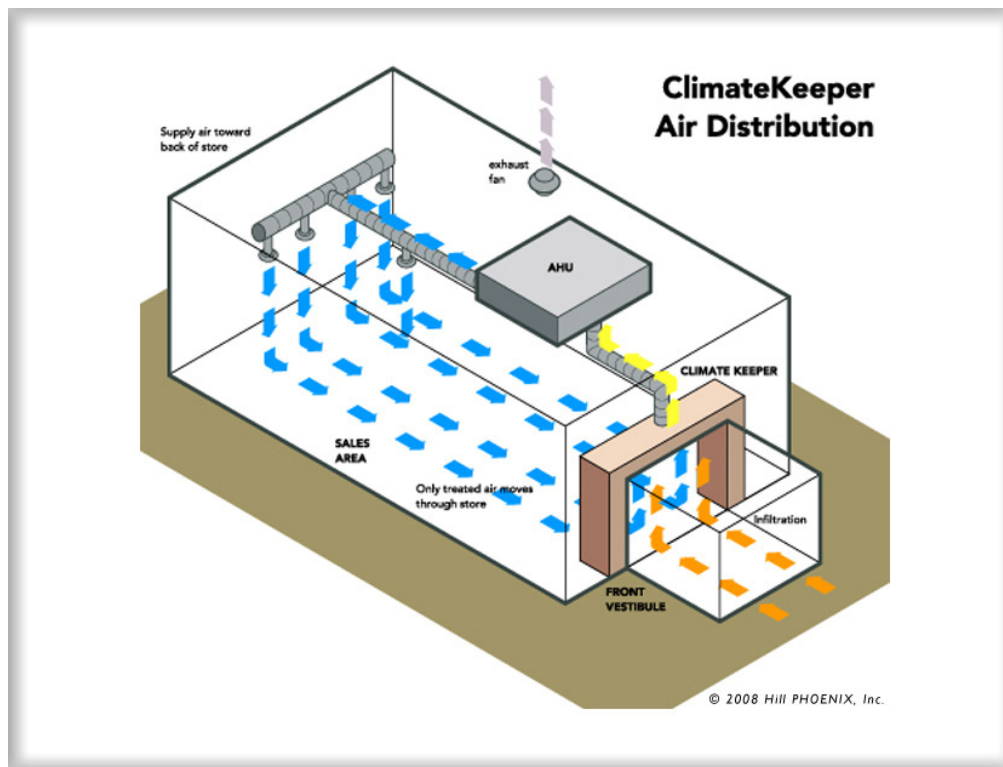
Climate Keeper™ - Expanding Energy Efficiency

In addition to the two-stage open-drive refrigeration system, Farm Fresh has also selected the Hill PHOENIX Climate Keeper technology. This technology reverses the return air and captures outdoor air at the store's front doors before it infiltrates the conditioned space. This will regulate and provide a more comfortable air temperature throughout the store.

Farm Fresh recently began to create more open vestibules at the front of its stores to provide a more friendly entry for shoppers. While the design element was pleasing to the eye, it soon became obvious that it created challenges with comfort at the front of the store. After some mathematical calculations, the company determined that in a typical store the entrance doors were opening 15,000 times per week. With this volume of traffic and the new open vestibule, the traditional concept of pressurizing the store wasn't working.



Climate Keeper helps solve that problem. “In a typical store design, the return air is pulled from the sales floor in an area concentrated near the back of the store. Make up air is introduced into the HVAC unit, which is generally located near the back of the store. These older designs setup air flow patterns that actually assist in pulling air from the front entrances of a building. With Climate Keeper, the reverse is true. The air patterns prevent infiltration past Climate Keeper. Return air is pulled to the front of the building. Make up air comes in from the front entrance with the customers. These separate air flows collide and their respective kinetic energies cancel each other out, stopping drafts near the front of the store. The combined airflow goes directly to the filters to remove impurities such as dirt and insects. It is then conditioned in the air handler and gets circulated into the store. This gives you a neutral building air system,” Perry explains.



Climate Keeper also has the ability to maintain neutral pressure throughout the building and doesn't bring in more air than needed, allowing a store to bring in only the amount of air that is exhausted. The Franklin store is Farm Fresh's fourth to feature Climate Keeper technology. According to Perry, all new stores will incorporate the Hill PHOENIX two-stage open-drive refrigeration system and Climate Keeper as the company works to meet its GreenChill partnership goals.

About Hill PHOENIX

Hill PHOENIX Inc., a Dover Company, is a leading designer and manufacturer of commercial refrigerated display merchandisers, refrigeration systems, integrated power distribution systems, and walk-in coolers/freezers. The company is based in Conyers, Ga. For more information, visit www.hillphoenix.com or call 770-285-3057.

About Farm Fresh

Farm Fresh is a SUPERVALU Inc. company. Farm Fresh has 46 stores and employs over 5,000 associates. SUPERVALU is one of the largest companies in the United States grocery channel with estimated annual sales of approximately \$44 billion. SUPERVALU holds leading market share positions across the U.S. with its approximately 2,450 retail grocery locations. Through SUPERVALU's nationwide supply chain network, the company provides distribution and related logistics support services to more than 5,000 grocery endpoints across the country. SUPERVALU currently has approximately 190,000 employees. For more information about SUPERVALU visit www.supervalu.com.

About GreenChill

GreenChill is an Environmental Protection Agency (EPA) cooperative alliance with supermarkets, and chemical and refrigeration equipment manufacturers. The alliance is dedicated to promoting the use of retail food refrigeration technologies that reduce emissions of ozone depleting substances and greenhouse gases by both reducing refrigerant emissions and increasing refrigeration system energy efficiency. The EPA estimates that widespread adoption of best practices, improved equipment design and service, and advanced refrigeration technologies could reduce refrigerant emissions by 1 million metric tons of carbon equivalent per year, which is the equivalent of taking 800,000 automobiles off the road, and save over \$12 million in operating expenses. For more information, visit www.epa.gov/ozone/downloads/GreenChillFlyer.pdf

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