

**Case Study**



These Carrier open-drive reciprocating compressors were part of the Food 4 Less supermarket's refrigeration system that was converted from R-22 to R-407F by RSI of West Sacramento. (Photo by Ted Rieger)

# With Broken Condenser Unit, Supermarket Sees Opportunity

By Ted Rieger, Northern California Correspondent

## R-22 PHASE OUT

Following the unexpected and sudden failure of a condenser for the refrigeration system at a Food 4 Less supermarket in Woodland, Calif., Refrigeration Solutions, Inc. (RSI) provided a temporary replacement condenser and recharged and converted the system from R-22 to R-407F refrigerant, resulting in minimal downtime for the store's operation.



The refrigeration system served the store's entire cooling load for all refrigerated display cases, its backroom meat and produce cold storage units for inventory, and the store's HVAC system. The condenser went down at 2:30 am on a Thursday morning, and RSI was able to have the refrigeration system running and the store open for business again

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## Food4Less R-22 Changeover

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by Friday afternoon. RSI president, owner and founder Sam Wilson noted that the store had been planning a refrigerant changeover for the system from R-22, given its price increase, reduced availability, and the planned production phase-out of R-22 by 2020. Wilson was able to access and connect a used Hussmann condenser unit, and noted, "With the failure of the evaporative condenser, the system lost its whole charge, so it was a good time to switch to a new, environmentally-friendly refrigerant, as there was no reason to go back to R-22." Wilson worked with Refrigeration Supplies Distributor (RSD) and its three nearby branches in Rancho Cordova, Roseville and Sacramento that supplied the refrigerant and the parts to convert the system. RSD helped select a replacement refrigerant suitable for the system. Tom Hardy of RSD said, "We looked at the refrigerant conversion charts and specifications, and R-407F provided similar performance capacities and efficiencies to R-22 across the range of low, medium and high temperature applications for which the store's refrigeration system operates." R-407F is an HFC class of

refrigerant manufactured by Honeywell under the label of Genetron Performax LT as an R-22 replacement that is a blend of 30% R-32, 30% R-125, and 40% R-134a. It is a non-ozone depleting refrigerant and has a lower global warming potential (GWP) than R-22. The recommended lubricant to use with R-407F in the compressors and system is polyolester oil (POE), a synthetic oil. Food 4 Less has a two-stage refrigeration system with six Carrier 5H line open-drive reciprocating compressors with a total system capacity of about 210 tons. Conversion required replacing all rubber/elastomer seals and O-rings in the refrigeration system's valves using kits, such as Wolverine reseal kits, supplied by RSD. Rubber seals can shrink and leak if used with R-407F and POE oil. "Converting the compressors' shaft seals was a big deal, and we had to replace and rebuild any valve section with an O-ring using a reseal kit, which is one of the major aspects of a refrigerant conversion," Wilson said. Seal replacements are recommended for shaft seals on open drive compressors, older solenoid valves, heat reclaim valves, Schrader fittings, and sight glass gaskets. RSI will install a new, more efficient Baltimore Air Coil (BAC) Trillium Series air/water con-

denser with a Dry-Coil Adiabatic Design that saves energy, reduces refrigerant charge and reduces operating costs. An on-demand adiabatic pre-cooler uses water only on the hottest days to maintain condensing temperatures better than typical air-cooled condensers. The BAC Trillium also uses high-efficiency electronically commutated (EC) motors and variable fan speed control. In addition to energy and cost savings, this high-efficiency condenser is expected to save the store an estimated 1 million gallons of water/year. "I think we will start seeing more of these condensers being installed in areas where water conservation is a big issue," Wilson said. RSI, based in West Sacramento, specializes in commercial and industrial refrigeration system installation and service and is the factory authorized distributor of Hussmann Refrigerated Display Cases and systems for Northern California. Wilson, who has 35 years of experience in the refrigeration industry, started RSI in 2005 and holds a C-38 refrigeration contractor's license. The company's clients include supermarket and grocery stores, food processing and packing facilities, and refrigerated warehousing operations. RSI is planning R-22 refrigerant conversions at other supermarkets in the region, including a change-out to R-407F at a store in Davis before the end of 2012.