

Compressor cycling problem solved with Copeland Discus Digital™ compressors



Result

- Reduction of compressor starts from 900 per day to three per day resulting in 12 starts over four days, extending compressor and contactor life.
- Optimized the cycling profile of all compressors on the same suction group, extending compressor and contactor life.
- Narrowed operating suction pressure range from 72 psig to 8 psig or 89% within minutes of activating the digital unloading technology, reducing energy consumption and extending product shelf life through tighter temperature control.

Application

Digital capacity modulation technology was added by upgrading Copeland Discus Digital compressors with CoreSense™ Technology operating on a new supermarket parallel rack.

Customer

Whole Foods Market with more than 300 stores nationwide.

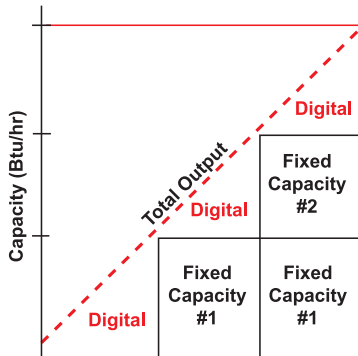
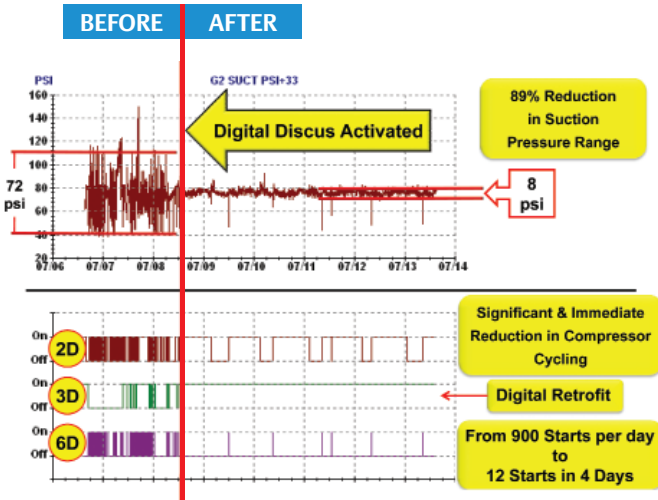
Challenge

Excessive compressor cycling was discovered only a week before the grand opening of their newest supermarket. Cycle counts of 900 cycles per day were recorded with eventual compressor failure inevitably putting a smooth grand opening at risk. This particular parallel rack was designed to cool 5 circuits: 3 prep rooms and 2 liquid subcoolers. All circuits have light loads during evening hours and the subcooler loads vary with seasonal ambient temperatures.

Originally, an uneven compressor strategy was selected, which is a common approach to handling varying loads. However, the load variations overwhelmed the unloading capability of the rack. Attempts were made to improve control of the product temperatures and the compressor cycling through the rack controller. Adjustments to narrow the suction pressure range resulted in excessive compressor cycling, while adjustments to reduce compressor cycling resulted in wide suction pressures and unacceptable fluctuations in prep room and subcooler temperatures. Local attempts to solve the problem were unsuccessful.

Solution

A digital upgrade kit was sent to the store and installed by a local service technician. The results were immediate and significant when the digital unloading technology was activated. Compressor cycle counts went from 900 per day to 12 starts over 4 days, while the operating suction pressure range went from 72 psig to 8 psig, 89% improvement.



“ The rack was operating with 900 compressor cycles per day. We were days away from our grand opening, and tried a variety of controlling methods to reduce cycle counts and still maintain product temperatures without success. We retrofitted the digital unloader on only one compressor and the impact was amazing. Within minutes of activation, compressor cycles were reduced to 12 starts in four days for the entire rack. ”

Michael Ellinger
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