

TURBOFIT

Another Danfoss Turbocor retrofit solution completed at Del Mar Gateway Building San Diego, California

Project Summary

- 172,500 sq. ft. office building in a prime location
- Existing centrifugal chillers are upgraded with new Turbocor oil-less VFD compressors improving reliability, efficiency, acoustics
- Monthly electric utility savings of over \$5000, demand reduction of 100 kW

Revolutionary Compressor Technology Makes a Difference

The Del Mar Gateway building in San Diego is a good-looking facility, and mechanically it just became more attractive. The eight-story 172,500 square foot office facility has been identified as one of the most sought-after office locations in the area.

Energy Star Building

The building is owned by Prentice Properties and is located in San Diego's Del Mar Heights area. With energy efficiency that already placed this office building in the top 25% among commercial buildings, it was listed as an Energy Star facility in 2002. Its chiller plant recently was upgraded to make the building potentially even more attractive to the tenants and its owners.



improvement and increased equipment redundancy. Tom Shaw from Alpha says, "We saw this as a unique opportunity to improve this plant, and the Turbocor compressor was the key,"

continued



Chiller Plant Upgrade

The building has a central chilled water plant which originally consisted of two 250-ton centrifugal chillers. The chillers operated between a range of 0.9 to 0.68 kW per ton. Alpha Mechanical Service and Engineering of San Diego has serviced the facility since it began operation, and approached the owner with a suggestion for a significant facility upgrade. This design-build engineering firm recommended replacing the two existing chillers compressors with six oil-free VFD centrifugal compressors by Danfoss Turbocor Compressors, Inc.

Energy Savings Drive Decision

The recommendation was based on Alpha's experience with Turbocor compressors, and what they saw as an opportunity for energy efficiency

Short Payback

Shaw indicates that his conservative calculations were that the conversion would save the owner over \$5,000 a month. Prentice Properties would also be able to take advantage of a rebate from San Diego Gas and Electric, which would bring the project payback down to less than three years. The total project cost was \$300,000. Prentice Properties accepted the recommendation.

Chiller Compressors Replaced

Alpha replaced each of the two original compressors with three Turbocor TT300 compressors rated at 80 tons apiece. Individual compressors can be staged on and off as the building's cooling load requires, thus the compressors are always operating at their peak efficiency. Actual operating experience indicates that under the new configuration, chiller operating efficiency ranges from 0.55 down to 0.35 kW per ton. In the recent month of May, the owner reported electric utility savings of \$7,000, including a reduction in the building electrical demand of over 100 kW.

Turbocor Compressor Has Unique Features

The Turbocor compressor is the world's first totally oil-free compressor design with its impellers and shaft suspended on magnetic bearings. The rotating shaft and attached impellers are the single moving part in the compressors, thus improving reliability and minimizing maintenance. The compressor operates at a remarkably low sound level of 70 dBA, has a digitally controlled variable speed capability and the compressors start on less than 2 amps.

Plant is Quieter, More Efficient

As a result of this recent upgrade, the chiller plant is much quieter. Shaw notes that where previously building maintenance and operations staff had to wear ear protection in the mechanical room, now it is relatively quiet. "It's a better work environment for those people who have to be in there periodically." Further, chilled water can now be delivered efficiently over the full range of plant operation even during "off-hours". Needless to say, the owner is happy, and building tenants continue to see their building as one of the best business addresses in San Diego.



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