

SMARTD Chiller Wins on Lowest Total Cost of Ownership & Extraordinary Reliability



Case Study: Mission Critical Data Center

Location: Florida

Application: Mission Critical Data Center

Duty: Two Chillers at 500 Tons Each

Model: SMARTD WA175.5

Benefits of SMARTD:

- **Lowest Total Cost of Ownership**
- **Improved Energy Efficiency**
- **Reduced Operating Costs**
- **Reduced Maintenance Costs**
- **Extraordinary Reliability**

This data center is one of several around the world, engineered by a national design and build company that specializes in data centers and other mission-critical projects. The customer is under strict confidentiality agreements and cannot disclose the high profile client or exact installation location.

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SMARTD was selected for these two chillers, and perhaps many more to come over the next two years, because of the company's unique ability to provide the lowest total cost of ownership of any alternative, and could provide equipment large enough to satisfy the critical process heat load and provide 2N redundancy for the client. Criteria for success included the following factors:

Energy - SMARTD was able to demonstrate a full load efficiency of .572 kw/ton and an IPLV of .345 kW/ton in an oil-free design. There were other competitive VFD chillers considered that had very good energy efficiency values when brand new, but when other factors such as limitations on reducing head pressure and the presence of oil that affects annual and long term cost of ownership, plus the insulating effect of oil on heat exchanger surfaces, demonstrated that long term IPLV values could not be maintained and operation costs would certainly be higher. Additionally, the patented SMARTD adaptive logic compressor staging system, works on power relationships and not on the traditional basis of percent demand, which demonstrates savings beyond the IPLV. The ability to ramp compressor speed equal to the ever increasing server farm load, provided easy scalability.

Annual Maintenance - Was reduced to tube cleaning, periodic electrical checks, and ten year capacitor replacements. There are no bearings to inspect every 8-10 years, and no expensive compressor rebuild cycle. A reduced expense service contract was required.

Reliability - Because of the oil-free design and DC drive system, the occurrence of acid formation common to lubricated AC drive systems, is largely eliminated, enabling five compressors on one circuit without the risks associated with traditional chillers. The extraordinary reliability of the SMARTD design was a key selection factor.

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