

DAIKIN MAGNITUDE CHILLER AND OPTIMIZED CONTROLS SAVE HOSPITAL OVER \$70,000 PER YEAR IN ENERGY COSTS

“I have never worked with a group that is so efficient and can get things done with minimal disruption.”

– Jerry Dyer, Director of Plant Operations, Luminis Health Doctors Community Medical Center

Overview:

The Daikin Applied team in Washington, D.C. has helped Luminis Health Doctors Community Medical Center (LHDCMC) meet its patient care and comfort needs for years, initially providing maintenance services. When it came time for the hospital to update its aging HVAC infrastructure which was experiencing increased maintenance needs and reduced efficiency, it quickly awarded the business to Daikin.

Founded in 1975 by a team of physicians committed to improving local access to care, the center provides medical and surgical services to residents in Anne Arundel and Prince George's counties in Maryland, and across the state's Eastern Shore. It joined the Luminis Health system in 2019 to form LHDCMC and is a nationally recognized non-profit hospital that has grown into an ultra-modern operation with more than 200 beds.

**LOCATION:**

Luminis Health Doctors
Community Medical Center

Lanham, MD, USA

**AREA SERVED:**

420,000 square feet,
212 beds

**CHALLENGE:**

Update aging HVAC
infrastructure while maintaining
clinical quality during the
COVID-19 shutdown

**SOLUTION:**

Magnitude® magnetic-bearing
centrifugal chiller and
optimized controls featuring
real-time performance analysis

LUMINIS HEALTH DOCTORS COMMUNITY MEDICAL CENTER



The Daikin team faced several project challenges, not least among them, the COVID-19 pandemic and associated shutdown. Timing was another concern. The hospital needed to maintain operations and continue to deliver high-quality care throughout the course of the retrofits. Interruptions in care, construction noise and facility issues (variations in heat, ventilation, cooling, etc.) can negatively affect patient recovery time and outcomes.

Solution:

To minimize the effects on patient care and staff productivity, the project was divided into phases. Phase one was slated to take place during the winter months to help moderate the demand on the equipment for chilled water. The second phase of the project was scheduled for summer, to help reduce the demand on the hospital's boiler for steam and hot water.

The turnkey package included new air- and water-cooled chillers, hot water and steam boilers, cooling towers, chilled and condenser water systems, hot water pumps, and chiller and boiler plant controls. The Daikin team partnered with an MEP engineer to ensure an efficient and code-compliant design. In addition, the team employed seasoned partners in the mechanical, electrical and controls trades to ensure a quality outcome.

The solution included Daikin's Magnitude[®] magnetic-bearing WMC and Pathfinder[®] AWW chillers to form a hybrid solution that uses a combination of air- (winter months) and water-cooled (summer months) technologies to meet hospital loads, according to the time of year. Magnetic bearing technology eliminates oil, mechanical seals, wear surfaces and gears for longer machine life and increased reliability. Using direct drive technology, integral variable-frequency drives and ozone-friendly R134a refrigerant, the Magnitude chiller can be up to 40 percent more efficient than standard centrifugal chillers. The variable drive responds according to cooling demand rather than operating at a constant rate. The award-winning Pathfinder is one of the most efficient air-cooled screw chillers on the market. It features proprietary, variable-volume ratio (VVR[®]) single-rotor compressor technology, and fully-variable-speed ECM condenser fan motors. Further, the chillers operate quietly and reliably—ideal for the health care environment.

To further optimize energy consumption, the Daikin team specified a state-of-the-art controls platform, leveraging the latest techniques for running the chillers and accessory equipment at the lowest energy consumption rate possible. The controls also provide facility operators with real-time energy data in terms of kW/ton performance.

Outcome:

In the midst of the carefully-timed schedule, but just after the chillers and cooling towers were set in place, Maryland initiated a COVID-19 shutdown, except for essential services. Daikin Applied and its dedicated partners worked to finish the project with a renewed sense of urgency and care. The project leads also helped LHDCMC secure a \$160,000 energy efficiency rebate from the local utility. The overall project, with magnetic-bearing chillers and controls optimization, will save the facility over \$70,000 per year in energy costs or 23% of the current chiller plant consumption.

