BELIMO ENERGY VALVE™

Mexico City Office Building Improves Delta T by 23% While Improving Occupant Comfort

Energy Valves Solve Low Delta T Syndrome

Torre Origami, a 360 foot tall [110 meters], 23-story office building, is occupied with up to 2000 people a day. The tower stands directly on the Avenida de los Insurgentes - one of the business epicenters in metropolitan Mexico City. It owes its original name to its nested architectural design, which is reminiscent of artistically folded paper.

Inefficient chiller plant performance and comfort complaints by building occupants motivated Carlos Salame, the owner of Torre Origami and Grupo Cinsa, the heating ventilating air condition (HVAC) contractor to seek assistance from Belimo. The solution was to retrofit the Air Handlers (AHUs) with Energy Valves to solve a persistent Low Delta T Syndrome problem. The result was a 23% improvement in chilled water Delta T.

TYPE OF BUILDING
Office Building

PROJECT
Retrofit

SECTOR
Commercial

PRODUCTS
Belimo Energy Valves, damper actuators, butterfly valves

BELIMO

Optimized Chilled Water Flow Saves Energy and Maintenance Costs

Facility and Project Overview

Torre Origami's primary variable flow chilled water plant includes three 330 ton [1.2 MW] chillers with a design flow of 1693 GPM [107 L/s]. Before the Energy Valve installation, at peak load, two or three chillers ran to deliver the required flow to the building.

"The power consumption of the three chillers in operation at the same time was correspondingly massive," recalls Victor González, the facility manager of the LEED Silver® for Core and Shell™ certified building. However, despite the tremendous energy usage, the cooling capacity in the office was anything but stable.

To solve this problem, Grupo Cinsa turned to Belimo and retrofitted 24 AHU cooling coils that serve each floor of the building with Belimo Energy Valves.

Belimo Delta T Manager™ Delivers Savings

Since Grupo Cinsa installed the Energy Valves in Torre Origami, the HVAC system has been able to use one chiller for 9 out of 12 months a year. González says: "All three chillers have never been used simultaneously since installation." The Energy Valves installed at the AHU's utilize the Delta T Manager algorithm to provide efficient heat transfer across the cooling coils. The chilled water Delta T now operates at the design temperature of 14°F [7.8°C], which is a 23% improvement over the previous 11.4°F [6.4°C] Delta T.

In addition to lower energy usage, Salame also was motivated to reduce maintenance costs. When the equipment is optimized, there are fewer component failures, which reduces our troubleshooting and repair cost and extends equipment life." These benefits are important considerations for the building contractor, who also operates most of his buildings himself. "The Delta T Manager technology within the Energy Valve continually optimizes the AHU chilled water flow," says Salame. "The improvement in the chiller plant efficiency has been extremely beneficial and has allowed us to make optimal use of our equipment."

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Carlos Salame, Owner of Torre Origami and Grupo Cinsa

Improved Comfort Is Smart Business

High-rise buildings demand more powerful and efficient HVAC systems than ever before. Property managers are increasingly focused on HVAC technology to provide occupant comfort and attract long-term tenants.

Grupo Cinsa operates the chiller water plant and the AHU's that provide cooling to each floor of the building. The tenants independently manage their VAV operation to achieve comfort. Comfort control was handled very differently depending on the tenant and was one of the main reasons why the original HVAC system did not produce the desired results.

The pressure independent function of the Energy Valve reduces over-pumping and provides the exact flow to match the demand of the floor served by the AHU's. "Before the Energy valve installation, we had constant temperature fluctuations," says González, "my phone kept ringing because of tenant complaints about temperatures being too high or too low." The Energy Valves brought Torre Origami the much-needed stability in the cooling system. "After the Energy Valve installation, rarely rings" states González.

Elias Pérez is also extremely satisfied with the improved performance of the HVAC system. Pérez is the facility manager for the financial company Gentera, which rents floors one through eighteen, and is the largest tenant in Torre Origami. "In addition to the increase in occupant comfort for our employees, the reduced energy consumption achieves our sustainability claim with the independent LEED certification of our office space."

Great Partners are the Key to Success

Belimo customer service is unparalleled in the HVAC industry, and ultimately for building operators. "We are obligated to our tenants for reliable operations," says Salame. "Technology-leading partners like Belimo, who deliver excellent customer service and consistent performance, are key to achieving operational excellence."

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Victor González, Facility Manager, Torre Origami

LEED Points from Energy and Atmospheric Category

Customer Satisfaction

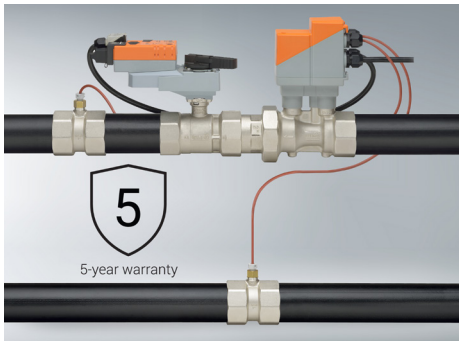
The Energy Valve with Delta T Manager incorporates many features and capabilities, including cloud-based analytics, patented glycol monitoring functionality, remote assistance, automated Delta T setpoint analysis and optimization, along with a comprehensive communication platform for integration to the Building Automation System (BAS).

The Energy Valve improves chilled water plant efficiency and provides a visual representation of key performance indicators. The built-in web server enables clear visualization of the valve's operation in real-time. With performance data stored for 13 months onboard the valve. "Thanks to the Energy Valve, we can record the operating data and compare it continuously," Salame remarked. Data communication from the Energy Valve to the BAS is over BACnet MS/TP. The Internet of Things (IoT) and the integration of Energy Valves in the Belimo Cloud would now be the next logical step for Grupo Cinsa.

Following the initial success with the retrofit at Torre Origami, Grupo Cinsa has installed over 100 Energy Valves in other high-rise projects, including Torre Anseli, Torre Diana, Torre Prisma, and Torre Alissa is in the planning stage. Salame states, "With Belimo, I have a partner who, over the years, has turned from a valve supplier with a striking color to a guarantee that our buildings will run smoothly."

LEED Accreditation

With the construction of the Torre Prisma, Carlos Salame was the first building contractor in Latin America to use the LEED standard in 2011. Since then, he has subjected all of his buildings to the internationally recognized certification for sustainability and environmental consciousness. "If you build in prime locations, it would be negligent not to strive for LEED certification," says Salame. In addition to the use of local building materials, the standard also provides for an efficient, automated HVAC system, and the Energy Valve helps achieve LEED points through Energy and Atmospheric category.



BELIMO ENERGY VALVE

The Energy Valve is a pressure independent valve that monitors coil performance and energy consumption while maintaining Delta T. The Energy Valve's core features and benefits include:

- Belimo Delta T Manager algorithm reduces pumping and chiller operating costs by increasing chilled water loop efficiency and mitigating low Delta T Syndrome.
- Key performance indicators are graphically illustrated with the built-in web server showing current and historical flow rates, energy usage, Delta T, and other points of interest.
- Energy monitoring with the integrated energy meter provides accurate coil performance data. The data helps to verify system performance during commissioning and acts as a baseline standard for system performance over time. This feature helps achieve LEED points through Energy and Atmosphere within credits 1 and 5.

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