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Case Study – Sandusky State Theatre

EDUCATION / HEALTHCARE / LODGING / GOVERNMENT / OFFICE BUILDING / RETAIL / SPECIAL



Carrier WeatherMaker® Rooftop Units and i-Vu® Controls Combine to Protect Historic Theatre Preservation Project Assets

Carrier Delivers Comfort, Humidity Control and Real-Time System Management



Precise comfort and humidity control now protect the Sandusky State Theatre's restored organ, decorative plaster details, tapestries, murals, new electronics, sound and lighting equipment.

OBJECTIVES:

Creating a controlled, comfortable and cost-efficient heating, ventilating and air-conditioning (HVAC) system for the historic 1928 Sandusky State Theatre renovation project was the unique challenge facing its Board of Directors. The existing equipment was nearly thirty years old, had outlived its useful life and was also incapable of providing proper seasonal humidity control. Precise humidity control and ventilation were critical requirements for the preservation of the theatre's many unique, recently-restored features such as its rare pipe organ, decorative plaster details, tapestries and murals.

During occupied as well as unoccupied periods, the theatre's technical director would be required to accurately monitor, adjust and manage the entire HVAC system in real time to deliver the highest level of comfort for the theatre's audiences, performers and staff. And as a community-based non-profit organization, the HVAC system would also have to help contain their energy-related expenses.

SOLUTION:

To meet all the HVAC- and controls-related comfort and operating requirements of the theatre, the Board of Directors turned to locally-based Gundlach Sheet Metal Works, Inc. to determine the correct equipment and controls solution, and to execute the installation. Gundlach then contacted Carrier Refrigeration Sales Corporation (RSC), who utilized E-CAT — a fully-integrated suite of tools for selecting, configuring, and generating performance data for Carrier commercial HVAC products. As a result, seven Carrier WeatherMaker® 50TC rooftop units (RTUs) with Humidi-MiZer® adaptive dehumidification system were installed for the 36,000 ft² facility. In addition, Carrier's i-Vu® building automation system (BAS) was added so that staff could manage comfort in the theatre from anywhere using a standard web browser.



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"We knew that the many features that Carrier rooftop units and i-Vu controls have would be the best solution for this unique and special project."

Andrew Gundlach
HVAC Service & Controls Manager
Gundlach Sheet Metal Works Inc.

SYNOPSIS:

For more than 80 years, the Sandusky State Theatre has been an integral part of the greater Sandusky, Ohio community. This historic landmark enhances the lives of the residents of North Central Ohio by providing a variety of programs of artistic, educational and social value. To restore, maintain and preserve this important community asset, the theatre's Board of Directors embarked on an extensive multi-year, multi-phase renovation. The final phase of the project required the design and installation of a complete HVAC system that included new equipment and controls. This new system would maintain and preserve the theatre's unique character for many years to come.

The theatre's many unique aesthetic and architectural features which were restored in the early phases included decorative plaster details, tapestries, murals, and perhaps most importantly, its Golden Voiced Marvel Page Organ (circa. 1940). The responsibility to design, install and maintain the new HVAC system for the 36,000 ft² facility would fall to locally-based Gundlach Sheet Metal, Inc. A respected local institution since 1889 and Carrier Hall of Fame Dealer, Gundlach is a sixth-generation, family-owned and operated company specializing in the installation, repair and maintenance of HVAC equipment and controls.

To initiate the Sandusky State Theatre's HVAC upgrade phase, Gundlach conducted an exhaustive assessment of the theatre's existing equipment and controls. The study concluded that the nearly 30-year old HVAC equipment and thermostats (which Gundlach had installed three decades earlier) had outlived their useful life and also posed time-consuming maintenance and technical challenges for the theatre staff. "Prior to the upgrade, the technical director would have to run around during performances, constantly adjusting the thermostats just to keep the audience as comfortable as possible," said Andrew Gundlach, Gundlach's HVAC Service and Controls Manager. "The theatre would clearly benefit from advanced rooftop units equipped with humidity control, demand controlled ventilation (DCV), economizers for 'free cooling', and online programmable controls," he continued.

Gundlach then reached out to Carrier Refrigeration Sales Corporation (RSC) to facilitate the final equipment and controls solution based on their findings. Seven Carrier WeatherMaker[®] 50TC rooftop units with Humidi-MiZer[®] adaptive dehumidification system and DCV now deliver comfort and efficient operation to the theatre year-round. Gundlach commented, "We knew that absolute humidity control was so important for this unique space. When we started up the RTUs for the first time, the humidity level was hovering around 75 percent. Then we activated the Humidi-MiZer feature... and watched the humidity level drop to exactly what we had hoped for."

Carrier's i-Vu[®] building automation system (BAS), which included Carrier ZS Pro sensors for monitoring temperature and humidity, were also selected to replace the theatre's antiquated thermostats. Using the i-Vu operator interface, the theatre's technical director can now monitor, adjust and manage the entire HVAC system from any location from a cell phone or tablet. The combination of the feature-rich WeatherMaker[®] 50TC RTUs, along with the i-Vu building automation system, now gives theatre staff precise, real-time system management. It also helps ensure occupant comfort, humidity control and lowered HVAC-related energy usage.

"The theatre is a Sandusky icon in our community, so it's been very rewarding for us to see the planning, coordinating with RSC and Carrier, installation and new level of the system's management all come together. But the real star of the show is the Humidi-MiZer feature... this level of humidity control will help protect all the beautiful restoration work that so many people have put into this project for many, many years to come." Gundlach said.

Project Summary

Location: Sandusky, Ohio

Project Type: Replacement / Retrofit

Building Size: 36,000 ft²

Built: 1928

Facility Usage: Performing arts theatre on the National Register of Historic Places

Objectives: Design and install an advanced, controllable, comfortable and cost-efficient HVAC

system to replace existing equipment which had outlived its useful life. Protect restored historic theatre aesthetic and technical assets.

Equipment: Seven Carrier WeatherMaker[®] 50TC RTUs with two-stage cooling, Humidi-MiZer[®] adaptive dehumidification system, demand controlled ventilation (DCV) and economizers

Total Cooling Tons: 120

Controls: i-Vu building automation system (BAS)

and Carrier ZS Pro thermostats

Major Decision Drivers: System solution would deliver a controlled, comfortable and cost-efficient HVAC solution with precise humidity control during performances and unoccupied periods.

Unique Features: The HVAC equipment and controls system were specifically designed to protect and preserve an historic theatre renovation.

Installation Date: 2019

For more information, contact your nearest Carrier Representative, call 1.800.CARRIER or visit our web site at carrier.com/commercial