



AIRSIDE / APPLIED / CONTROLS / SERVICE / SPECIAL SOLUTION / TOTAL SYSTEM / UNITARY

# Case Study – DeLand Middle School

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



## AquaForce® 30XV Chillers Deliver High Efficiency, Lowered Acoustics and Smaller Footprint to Middle School Campus

**Variable-Speed Technology  
Brings Best-in-Class  
Efficiency and Performance**



*The AquaForce® 30XV chiller is ideally suited for schools and any other applications where quieter operation, high efficiency and flexible footprint are essential.*

### OBJECTIVES:

Located in Volusia County, Florida, DeLand Middle School serves over 1,000 sixth through eighth grade students with nearly 70 faculty members. When originally built in 1981, DeLand Middle School utilized a water source heat pump-based heating, ventilating and air conditioning (HVAC) system. To meet the needs of its expanding student population, the school board initiated a 140,000ft² school renovation and HVAC system upgrade which would need to achieve three specific goals. First, implement a new HVAC system solution that would help reduce energy consumption. Second, ensure the new HVAC equipment would have acceptable acoustic levels for a residential neighborhood due to an adjacent apartment complex while providing better sound levels in classrooms to help improve learning. Third, provide a new campus-wide control system to precisely meet the comfort needs of the students and faculty.

### SOLUTION:

While attending a Carrier engineering conference highlighting the AquaForce® 30XV air-cooled screw chiller with Greenspeed® intelligence, the senior HVAC construction project manager for Volusia County Schools was able to witness the chiller operating at full load. Impressed by the energy efficiency of its variable-speed technology, sound-sensitive acoustics and small footprint, he subsequently selected two AquaForce® 30XV-250 ton high-tier variable frequency drive (VFD) screw chillers as basis for design for the DeLand Middle School HVAC upgrade project. Additionally, the project was specified with ten Aero® 39MN air-handling units, 117 variable air volume (VAV) units and a campus-wide Automated Logic Corporation (ALC) control system. Due to the efficiency of the 30XV chillers, the local utility, Duke Energy, issued a \$24,610 rebate to Volusia County Schools.



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Volusia County, located in the heart of the East Coast of Florida, is home to DeLand Middle School, one of 85 schools serving the educational needs of students in this rapidly growing, progressive area. The school system implements an ongoing agenda of facility upgrades and when DeLand Middle School was originally built in 1981, it utilized a water source heat pump-based system which was due for an upgrade.

To meet the needs of the middle school's expanding student and faculty population, the school board initiated a 140,000<sup>ft</sup> school renovation and HVAC system and controls upgrade which would need to achieve three specific goals. First, the new HVAC system solution would need to lower energy consumption to help reduce DeLand Middle School's operating costs. Second, the new HVAC equipment would need to have acceptable acoustic levels for a residential neighborhood due to an adjacent apartment complex while providing better sound levels in classrooms to help improve learning. Third, a new campus-wide control system was required to precisely meet the comfort needs of the students and faculty.

"The combination of Carrier's HVAC components, warranty and maintenance contracts, and ALC controls, were just what we were looking for."

David McCarty,  
Senior HVAC Construction  
Project Manager  
Volusia County Schools

During a visit to a Carrier engineering conference highlighting the AquaForce<sup>®</sup> 30XV air-cooled screw chiller with Greenspeed<sup>®</sup> intelligence, David McCarty, Senior HVAC Construction Project Manager for Volusia County Schools was able to observe the chiller operating at full load. Impressed by the energy efficiency of its variable-speed technology, sound-sensitive acoustics and small footprint of the AquaForce<sup>®</sup> 30XV chiller, he subsequently specified two 250 ton chillers for the DeLand Middle School project. "Carrier did an outstanding job for us and I'm very impressed with their chillers. The combination of Carrier's HVAC components, warranty and maintenance contracts, and Automated Logic Corporation's (ALC) controls were just what we were looking for," McCarty said. "Additionally, their response to any emergency service issues has been very impressive," he continued. He also visited the Carrier Charlotte manufacturing facility, where the AquaForce<sup>®</sup> 30XV chiller is produced.

In addition to the two chillers, the project was specified with ten Aero<sup>®</sup> 39MN air-handling units, 117 variable air volume (VAV) units and a campus-wide Automated Logic control system. This helps ensure precise levels of comfort delivered to all the various classrooms, gymnasium, cafeteria, and faculty offices while efficiently controlling the operation of the chillers.

In addition to the Carrier and ALC solutions implemented at DeLand Middle School, McCarty indicated that the Volusia County School System has also specified 11 Carrier chillers for five other school locations.

The AquaForce<sup>®</sup> 30XV chiller was developed to ensure the best performance and efficiency in a solution that's easy to install, easy to service, highly reliable and quiet. Its user-friendly control with color touchscreen display is self-optimizing, enabling the 30XV to run at optimum performance at any given set of conditions.

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### Project Summary

**Location:** Volusia County, FL

**Project Type:** Retrofit

**Building Size:** 140,000<sup>ft</sup>

**Built:** 1981

**Facility Usage:** Middle School

**Objectives:** Replace outdated water source heat pumps with an HVAC system solution to help reduce

energy consumption; deliver acceptable acoustic levels and install a new controls system to precisely meet comfort needs campus-wide.

**Equipment:** Two AquaForce<sup>®</sup> 30XV-250 ton high-tier variable frequency drive (VFD) screw chillers with Greenspeed<sup>®</sup> intelligence, ten Aero<sup>®</sup> 39MN air handlers (AHUs), 117 variable air volume (VAV) terminal units with electric heat and eight VAV terminal units without heat.

**Total Cooling Tons:** 500

**Controls:** ALC controls campus-wide

**Major Decision Drivers:** High efficiency chillers, sound-sensitive acoustics, smallest footprint, warranty and maintenance contracts.

**Unique Features:** Variable-speed technology delivers energy efficiency, quiet operation, tiered approach for a broader operating range, design flexibility and smallest footprint.

**Installation Date:** 2018

For more information, contact your nearest Carrier Representative, call 1.800.CARRIER or visit our web site at [carrier.com/commercial](http://carrier.com/commercial)