



White Plains' 75-acre campus offers almost 400 courses to 9-12th grade students.

Daikin Unit Ventilator and VRV Solutions Provide Design Flexibility

ISSUE:

White Plains High School, located on a beautiful 75-acre campus in New York, offers almost 400 courses to 9-12th grade students. The B-Wing, one of two original structures on campus, was constructed in the 1950s leveraging the common architectural design methods of the era. Exterior structural beams ensured the integrity of the building, and it has stood the test of time. However, the original design posed some challenges when it came to updating the HVAC system.

Daikin VRV solutions have the inherent flexibility to work around architectural hurdles to deliver a solution that fits the space regardless of size, age or design technique. In this particular scenario, school administrators knew they wanted a like-for-like replacement of the current unit ventilators (UV) to avoid downtime, added expense associated with designing a new solution, and to use the existing hot water system.

When approaching the design of the replacement system, it was recognized that the exterior structural beams were blocking the free-air space for the new, more efficient compressorized unit ventilator design, which required higher condenser airflow than the older UV models.

SOLUTION:

To eliminate the need for condenser airflow, Daikin Applied unit ventilators, which come with factory installed electronic expansion valves (EEVs), utilized remote Daikin VRV IV heat pump condensing units. Unit ventilators have the ability to bring in up to 100% outside air directly in the classroom, and without the need for condenser airflow the existing louver opening was sufficient. The VRV condensers were placed outside on ground level where there is ample space and airflow to reject heat in cooling mode. The unit ventilators were also able to use the existing hot water heating system during the cold New York winters.

Unit ventilators continue to be a great application in educational spaces because of the ability to provide individual control of heating and cooling and direct integration of fresh air into the classroom.



NAME:

White Plains High School

LOCATION:

White Plains, NY, USA



AREA SERVED:

12,000 ft²



ISSUE:

Provide an HVAC cooling solution to a project that has architectural hurdles



SOLUTION:

Daikin unit ventilators and Daikin VRV heat pump condensing units

SOLUTION (CONTINUED):

The design included demand control ventilation, a feature which increased operating efficiency for the school and translates into dollars saved for the District. EEVs in the system modulate the precise amount of refrigerant to each zone, meeting the requested set point in a more gradual and efficient manner. The demand control ventilation feature is continuously monitoring CO2 levels in the classrooms and bringing in fresh air accordingly, optimizing the volume of outside air supplied to the space and reducing energy waste. The single air filter in each unit removes particulate from raw outside air before it is conditioned and supplied to the classrooms. The filter is easy to access and replace for facilities staff giving them more time to tend to backlog work.



Daikin unit ventilators provide individual control of heating and cooling, as well as direct integration of 100% fresh outdoor air into the classroom.

OUTCOME:

The students and faculty now enjoy individual zone control and the lower sound levels that accompany Daikin's ductless solutions. The absence of ductwork removes potential audible distractions such as rattling, humming and buzzing. The outdoor air processing capability bolsters indoor air quality, creating better learning environments for teachers and students alike.

Daikin VRV IV condensing units also played a large part in providing an environment that promotes productivity. The VRV IV's compact footprint provided multiple options for placement, and the best choice was ground level where there would be short, non-invasive refrigerant pipe runs. VRV condensers come with a corrosion resistant coating, test rated for 1,000 hr. salt spray, which makes the equipment suitable for harsh weather and coastal areas such as White Plains, NY. The hydrophilic

coating also washes away dirt after rainfall further extending the life of the system.

White Plains Director of Facilities, Frank Stefanelli is pleased with the solution Daikin provided, adding that the students are the ones who are most thrilled. Frank elaborated on the previous comfort levels, "We got many calls from students and teachers saying that the classrooms were too warm, when I went to walk the B-Wing you could see the kids were sweating. Even in the winter, the rooms would get too warm from the lack of temperature control, it pained me to see the windows open on my way home from work." This winter however, the windows have been closed and students are thankful for enhanced comfort delivered by Daikin.



Existing penetrations to the building were obstructed with beams blocking condenser airflow. To circumvent this issue, VRV IV heat pump condensers were used to reject heat in a remote location.



Daikin VRV IV's compact footprint provided multiple options for placement at ground level where there would be short, non-invasive refrigerant pipe runs.