

A lesson on the benefits of modern modular chillers in K-12 schools

By Tom McDermott, ClimaCool

When the school bell rings in the morning, bodies fill the classrooms. During lunch, classrooms empty and lunchrooms fill. Creating a comfortable temperature for a lecture-learning environment is different from what a gymnasium needs. With this constant fluctuation and the need to heat while you cool, many engineers are realizing its time to brush up on the benefits of modern modular chillers in K-12 schools.

Traditionally, modular chillers were a solution for retrofits, cooling and tight spaces, but now they are taking over schools because of their flexibility to simultaneously heat and cool, their ability to offer truly tailored turndown and their ease of maintenance. Let's review the key characteristics redefining modularity:

Ability to heat, cool or simultaneously heat and cool keeps students comfortable, without compromising efficiency

Maintaining a comfortable environment throughout a school is critical but can be difficult to do successfully because of the constant fluctuation of occupants and shifting of loads. The building design is also challenging, as it is also common for half of the school to be heated by the sun requiring a need for cooling, while the other half is shaded and needing heat.

To accommodate these challenges, schools have traditionally had to purchase and maintain separate boilers and chillers. This is no longer the case with modern modular chiller designs. They have the ability to provide heating, cooling, heat recovery and heat pump technology offering school's continuous comfort and efficiency all from one system. Instead of throwing away the heat, these chillers can recover and harness the heat produced in one part of the building and use it another, helping to increase a school's energy efficiency.

Passing the test with lower total cost of ownership

Cost is often a top concern for schools when selecting an HVAC system. Instead of simply looking at the initial cost, it is important to study up on the expected cost over the lifespan of the equipment. Modern modular chillers can help schools control cost over time. As demonstrated earlier, these chillers have the ability to use only the energy needed, and nothing more. Each module is designed to function independently, meaning schools can power them on and off as needed. Instead of wasting energy cooling a large, empty auditorium, the modular chiller can be turned down to control costs and improve energy efficiency. The same is true for off-peak hours or summer and winter seasons. It also eliminates the need to purchase and maintain two separate and costly pieces of equipment – the boiler and chiller.

With no downtime, true redundancy keeps students in the classroom, even during maintenance

If a school cannot heat or cool properly, certain codes and union laws may require they shut down during maintenance. Downtime is costly and stressful and now with modern modular chillers – avoidable. Modern modular chillers provide schools confidence that their system will perform all day, every day. Instead of relying on backup generators during a breakdown, which are not always properly sized, some modular chillers are designed with separate electrical feeds, providing true redundancy. That means even if one module fails or requires maintenance, the other modules can continue operating to keep the building running at full capacity, while maintaining energy efficiency.

Minimal sound means students (and teachers) can stay focused

Historically, modular chillers were designed without a post and panel construction, which limited the ability of utilizing insulated sound panels. However, it is now standard for today's modular chillers to be designed with a post and panel construction. The frame comes as a built in feature requiring no added



startup labor of field erecting posts to hold the panels. Additionally, the insulated sound panels protects the system components and dampens the noise, so all eyes remain focused where they belong, on the chalkboard.

Facility maintenance gives modular chillers an “A” for ease of maintenance

With the ability to service individual modules, while other modules remain operational, the modern modular chiller design makes maintenance easier. These chillers now give facility managers easy access to service the compressor (located to the front and lower part of the unit). The updated design has also relocated headers from the front and back of the unit to the top, meaning they no longer block the heat exchangers, and do not need to be taken apart during service. Unlike traditional chillers, which require the manufacturer to service the equipment, modern modular chillers use off the shelf components allowing maintenance to be completed in-house. Flushing out the heat exchangers, the most important part of servicing a modular chiller, is also easier as modern units are designed with individual flush ports for each heat exchanger, simplifying the cleaning process and eliminating the need to shut down the full bank of chillers.

While selecting an HVAC system for a school is no easy task, modern approaches to the modular chiller design and function are challenging the industry to think differently and to expect the unexpected. When designing for schools, engineers no longer have to compromise one benefit over another. Instead with today's modular chillers, they can achieve enhanced energy efficiency without the added costs and can help schools overcome some of their biggest HVAC challenges.

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