



Dectron Energy-efficient Design Saves Mizzou \$130k in Annual Operating Costs

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Columbia, Mo. – Visitors to the \$49-million Rothwell Brewer Student Recreation Center are usually in awe of one of the nation's top five recreation projects and Missouri's largest aquatic complex. Equally awesome is the behind-the-scenes energy savings that has been built into the state-of-the-art project, which will save the University of Missouri millions of dollars in operating costs over the life of the center's dual natatoriums.

Rather than ordering a conventional economizer to take advantage of approximately 1,500 hours of cooler outside air during the spring and fall seasons, energy saving configurations were specified for each of the five commercial dehumidifiers supplying the competition pool and leisure pool natatoriums.

The option-packed equipment configuration by Dectron places 4,100-cfm (minimum code) and 22,900-cfm (purge) exhaust fans before the evaporator coil, and relies solely on the supply air fan to recirculate natatorium air during unoccupied hours, at a significantly reduced energy rate. The minimum exhaust fan operates only during occupied periods, as opposed to a conventional economizer, which operates a full-size return fan in conjunction with the 24/7 supply fan.

The configuration specification, which was overseen and facilitated with Dectron by the manufacturer's representative, is capable of introducing 100% outside air to purge the space effectively during super-chlorination

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periods. Splitting the two exhaust fans makes each dehumidifier more efficient with both net sensible cooling and fan operation.

In comparison to conventional economizer operation, the resultant annual fan energy savings from the 37,800-square-foot competition natatorium's four DRY-O-TRON® DS-242 dehumidifiers is \$62,000, plus another \$14,400 for the 8,000-square-foot leisure pool's single DRY-O-TRON® DS-282. Dectron's technology allows for smaller compressors than those used in comparably sized dehumidifiers, thus saving energy while delivering equal moisture removing capacities.

When combined with Dectron's glycol heat recovery option, which extracts heat from the exhaust airstream to preheat outdoor air, the large and small natatoriums save an additional \$46,000 and \$12,000, respectively, in annual compressor operation and air heating savings.

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Additionally, one large unit would have complicated the air distribution design, which is divided into zones and now supplied by each unit. Four DRY-O-TRON® units also allowed the ductwork size to remain below the 48-inch diameter threshold, which is a National Fire Protection Association (NFPA) code related to sprinkler system placement.

All air distribution is from ceiling-hung ductwork, as the preferred method of adding under deck air distribution was physically impossible in both the Rothwell Gymnasium and Brewer Fieldhouse buildings' retrofits due to their existing foundations. Another energy saving option employed was recovering compressor heat to provide free pool water heating for up to 9 months of the year. The design also saves significant energy, while simultaneously providing air comfort to the 1,000-seat spectator section. The large 7,000-square-foot area uses a supplemental chilled water-cooling coil in a Dectron unit that supplies cooler, dehumidified air to spectators via a single duct run.

The Rothwell-Brewer project is the largest recreation project in the history of Missouri higher education and will undoubtedly influence future natatorium designs, especially in light of growing energy saving demands. ■



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