



## Mini-Split Heat Pumps Improve Efficiency and Comfort, Reduce Noise for School

*Replace ailing chiller, cooling tower, and fan-coil units*

Started in 1964 by the Sisters of St. Joseph Benedict Cottolengo, Marian Center School and Services in Miami Gardens, Fla., includes a school for students with developmental disabilities, an adult day training and work program, and a full-time residential cottage for women. In the 10,000-sq-ft school building, the 40-plus-year-old central air-conditioning system “was on its last leg,” Executive Director Thomas Horan said.

Featuring a 40-ton R-22 reciprocating chiller, a cooling tower, and dozens of fan-coil units, the system had deteriorated considerably. The key dilemma was the discovery that the chilled-water piping, buried under the school, had ruptured. Additionally, “The sisters and the students were having an awful time competing with the noise of the fan-coil units,” Sister Lidia Valli, school principal, said.

“We couldn’t decide what was worse: the hissing, whining, gurgling



Startup service technician Garfield Thompson performs startup on one of the condensing units.

noises from the old room units or the heat and humidity we and the students had to endure,” Sister Carla Balentini, facility manager, added.

“Sadly, we didn’t have an emergency fund for anything of this mag-

nitude financially,” Horan said.

In stepped Charles Del Vecchio, owner and chief executive officer, and son Chuck Del Vecchio, president, of Tropic Supply Inc., a Miami-based HVAC and refrigeration wholesale

distributor. Chuck’s son was a student at the school. After covering the cost of repairing the old chiller system for several years, Tropic Supply offered to donate new equipment to the school.

The Del Vecchios and school administrators decided the best solution was to abandon the ruptured lines and remove the chiller, cooling tower, and fan-coil units.

“We were drawn to the energy efficiency of new smaller R-410A systems,” Bob Garrison, president of Pembroke Pines, Fla.-based Garrison Mechanical, the firm chosen to replace the ailing equipment, said. “A big advantage to the installation of multiple smaller systems would be the ability to easily select which areas of the school to cool.”

The team settled on a plan to install 23 Fujitsu mini-split heat pumps. The Del Vecchios, with the help of engineers with Boca Raton, Fla.-based Formica & Associates Inc., drew up plans for the installation of ductless split systems.



Installers Eugene Roman and Eli Castro put the finishing touches on an indoor-unit installation.



The school building is a single-story rectangle with a central hall and six large classrooms, each of which has a smaller observation room behind a two-way mirror. There also are several bathrooms, a library, and administrative offices. According to Chuck Del Vecchio, key job-site challenges were the many sliding glass walls and the school's poured-concrete roof.

"There's no attic space up there to run refrigerant lines to conceal ducts or to hide air handlers," Chuck Del Vecchio said. "It was an open-and-shut case for mini-splits."

Garrison Mechanical began the job with initial preparations.

"Once the grounds were cleared, we framed out and poured concrete slabs for all of the condensing units," Garrison said. "Then we removed and scrapped all of the old equipment."

The last facet of the job—installation of new equipment—began during the summer of 2009. According to Garrison, the job moved briskly in phases with two two-man crews.

"We began at one end of the building and completely installed and wired each new system, placing them online and ready for service," Garrison said. "This took less than a month, start to finish."

Garrison's crew made the indoor units fit into spaces where the old equipment had been. Wood enclosures, stained to match other furnishings, were installed to conceal and offer easy access to fresh-air filtration, a Miami code requirement. The evaporator units then were attached to the outer face of the enclosures for aesthetic purposes.

According to Garrison, the facility received a total of 39½ tons of heat-pump comfort control with air filtration and humidity control. Seasonal

energy-efficiency ratio jumped from 7 or 8 to the 16-to-18 range.

"The difference is amazing," Horan said. "We had become so conditioned to the noise of the old units and their inability to keep us comfortable. Now, just entering the rooms, experiencing

the comfort, and not hearing all that rattle ... it's a, 'Thank God,' moment every day."

*Information and photographs courtesy of Fujitsu.*

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