DAIKIN AC
absolute comfort

absolute comfort case by case

Daikin VRV® Retrofit Provides Comfortable, Quiet Rooms for Residents

The Challenge

An assisted living center needed a cost efficient HVAC system replacement which could be installed without disrupting the residents.

Daikin's Solution

Daikin's energy saving VRV system was installed in minimal time and the advanced zoning capabilities allow residents to choose their individual comfort levels.

Application:

Renovation
Assisted Living Facility

Location:

Black Mountain, North Carolina

It was time to replace the heating and cooling systems at the Marjorie McCune Memorial Center in Black Mountain, North Carolina. Like most facilities of this type and size (only 20 tons), packaged terminal air conditioners (PTAC) were originally used, as a 4 pipe chiller system would have been far too expensive and difficult to maintain. This is usually at the expense of sound levels, temperature and humidity levels, space savings and running costs.

In choosing a replacement for the existing PTACs and boiler, the facility also had to evaluate the potential disruption to the residents' lives the replacement would cause. The solution was Daikin Variable Refrigerant Volume (VRV®) Systems which provides the center with performance equivalent to a premium chiller system, in a package that is easy to install, cost effective, and allows each room's temperature to be set at the residents' personal preferences.

The decision was made to remove the PTACs which had been in place for decades. They began requiring more and more repairs, and had become progressively more costly to run. In their place, the highly

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automated Daikin VRV system saves space in each room, operates at a very low sound level, keeps the rooms comfortable in the cold winter months without a boiler, and saves energy and maintenance costs.

Jim Coates, the center's maintenance supervisor, has expressed the changeover was very successful.

The previous PTACs that heated and cooled the rooms operated with heat generated by a large hot water boiler. "That boiler had to keep running almost constantly during the heating season to supply water to the hot water coils in each PTAC," explained Henry Snelson of Coastline Distribution, the company which assisted in the engineering and sale of the Daikin system. "From the end of September through May, this very large and expensive-to-run boiler had to stay in operation." In contrast, the VRV provides efficient heat pump heating to individual areas, on demand, only when required.

"…We investigated various system options, and the bottom line was that the Daikin system was the most effective system for the money."

Brad Stickels, Owner, Stickels Service Co.

"…The piping system design sped up the installation. Working with an electrician, they could quickly handle the installation in stages, and leave in a very short time. I'd say they finished two, sometimes three rooms a day."

Jim Coates, Building Engineer

Daikin's VRV replaced a very large and expensive-to-run boiler that had to stay in operation from the end of September through May. In contrast, the VRV provides heating and cooling to individual areas, on demand, only when required.

Brad Stickels, the HVAC contractor who installed the system, noted the initial solution proposed, was to change the PTACs hot water coils to electric heat. "But to do this, they would have had to completely revamp their electrical system and rewire every room in the building in order to accommodate the demands of electric heat," Stickles said. "So, I suggested they consider a Daikin VRV system instead. It would be simple to install, require greatly reduced electricity, keep everyone comfortable, and save energy costs," he said. "We investigated various system options, and the bottom line was that the Daikin system was the most effective system for the money," he said.

TEMPERATURE CONTROL

Every VRV system includes a highly intelligent inverter-driven compressor which varies its speed, to supply only the amount of cooling or heating required by the actual load, thus eliminating expensive over-cooling or over-heating which is common with conventional systems.

In the case of the Marjorie McCune Memorial Center, the systems are comprised of two six-ton heat pumps and one eight-ton heat pump unit, serving each of the facility's three wings. Each of the 32 zones are served by FXAQ duct-free wall-mounted indoor units. Each of these indoor units has a PID controlled electronic refrigerant expansion valve, which again, matches the amount of cooling or heating to the actual room load at any given time. This ensures the room temperature is held close to the set temperature, and continuous dehumidification occurs.

This is in comparison to a conventional system, which experiences fluctuations in dehumidification as a result of conventional ON/OFF control. These

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compact indoor units measure approximately 11 inches high by 31 inches wide by 9 inches deep.

As the center is located in the hills of North Carolina, where extremes in humidity are common, the VRV system will avoid the fluctuations of temperature and humidity that used to occur each time the compressor of the previous system switched on and off.

There were some initial concerns about moving from the existing hot water heating system to the advanced technology of the Daikin Heat Pump VRV system. Henry Snelson of Coastline explained, "The facility operators were apprehensive about making the change because of concerns about the heat pump's operation in the cold months. But the data generated by a similar Daikin application installed in the very cold New England climate helped prove the effectiveness of the VRV system. Once they reviewed the data, they were ready to move forward."

KEEPING EVERYONE HAPPY

Daikin's VRV system incorporates a patented piping system and a Daikin Intelligent Touch Controller color LCD (touch-screen centralized controller), which gives the building administrator the ability to control each room's temperature setting remotely, as well as a host of other functions.

The Daikin-exclusive REFNET™ joints along with the copper piping serve as the circulatory system for the R-410A refrigerant in the heat pump. The system design optimizes refrigerant flow compared to T-joints and headers on similar alternative equipment.

The piping system design also sped things along during installation, explained building engineer, Jim Coates. "It was very important not to disrupt the lives of our residents during the renovation," he explained. "They were able to run the small diameter refrigerant lines above the ceiling, and drop off connections into each room. Working along with an electrician, they could quickly handle the installation in stages, and leave in a very short time. I'd say they finished two, sometimes three rooms a day."

We haven't had one complaint about sound levels and the system has run without a problem. In fact, the outdoor units are also incredibly quiet, which both our staff and our residents have found to be remarkable," noted Coates. "Our aim is to make our residents feel at home, and with the Daikin system, we've accomplished that goal."

touch Intelligent Controller

The Intelligent Touch Controller gives the administrators at Marjorie McCune the ability to monitor the temperature in each residents' room. Other features:

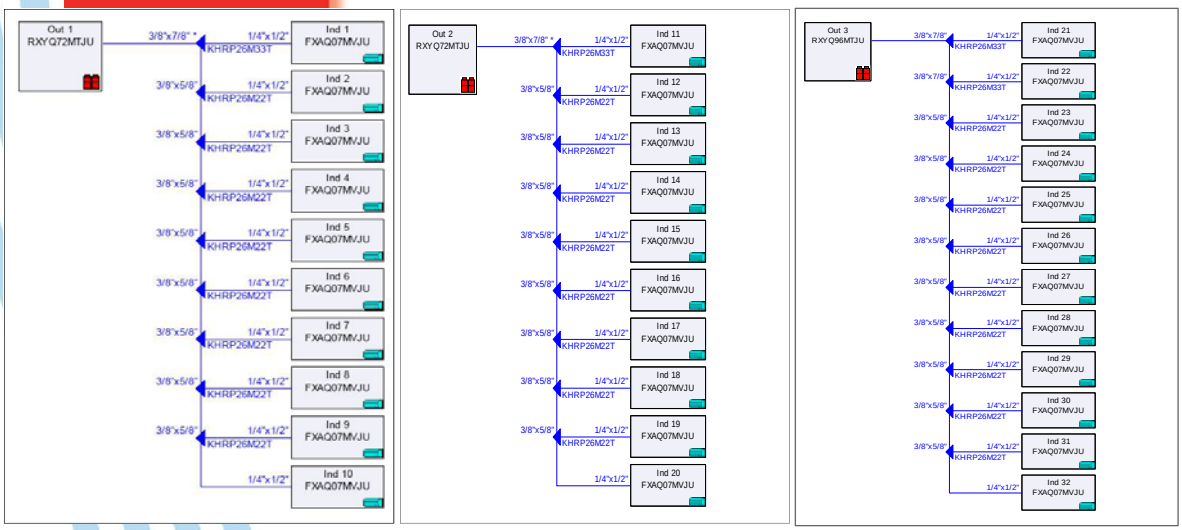
- Control the HVAC system remotely
- Malfunction reports to mobile phone anywhere
- Connects up to 128 indoor units

Additional Information

DAIKIN AC VRV EXPRESS

Daikin's proprietary software tool lets you incorporate specific client requirements. Use it to design a system that fits seamlessly into the most awkward space, calculate system performance and ensure that all necessary design parameters are included in specification and engineering drawings.

MARJORIE MCCUNE MEMORIAL CENTER PIPING DIAGRAM



REFNET ™ PIPING: ANOTHER DAIKIN

Invented by Daikin, the advanced REFNET piping system is easy to install and provides greater design flexibility than competitive systems. Compared to regular T-joints and headers, the unique REFNET design increases system reliability and optimizes refrigerant.

About Daikin AC

Daikin AC offers North America intelligent air-conditioning solutions with superior energy performance and sophisticated design. These advanced systems fall under the Quaternity™, VRV®, VRV-S®, and SkyAir product names. The company, based in Carrollton, Texas, is a subsidiary of Daikin Holdings (USA), Inc., which is owned by the Japanese-based Daikin Industries, Ltd. For more information, call 866-4DAIKIN or visit www.daikinac.com.

Location

Marjorie McCune Memorial Center
Assisted Living Facility
101 Lions Way
Black Mountain, North Carolina 28711
USA

Product Profile
Daikin Equipment

Qty/Outdoor Model	Qty/Indoor Model
2/ RXYQ72MTJU Heat pump VRV M R410A	32/ FXAQ07MVJU A – Wall Mounted Unit
1/ RXYQ96MTJU Heat pump VRV M R410A	
Controllers	**Accessories**
1/DCS601C71 Intelligent Touch Controller	25/ KHRP26M22T REFNET branch piping kit
	4/ KHRP26M33T REFNET branch piping kit

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