

Case study

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Grace United Methodist Church

Innovative HVAC system provides quiet operation, maximizes comfort, allows centralized energy management • Hastings, Nebraska

Grace United Methodist Church in Hastings, Nebraska, is one of 1,035 local congregations in the Great Plains Conference, which covers Kansas and Nebraska. Besides worship services, the 700-member Grace United congregation carries out the work of the United Methodist Church through choir groups, ministries and a variety of church organizations and activities.

Challenge

The aging chiller/boiler system, original to the Grace United Methodist Church, was in need of replacement. Facility managers were having difficulty finding parts for the inefficient system, which required frequent, costly service calls. Located on one end of the building, the chiller/boiler system could not properly heat or cool outlying spaces or keep up with the increasing load demands, resulting in inconsistent temperatures across the building. With the facility serving multiple uses and varied schedules, the church also faced the issue of wasting energy to heat and cool sometimes unoccupied spaces. With no central control system, Grace United Methodist Church staff had no way to properly schedule individual zones or the building as a whole. Experiencing drastic increases in their utility bills, church administrators decided to make a change.

Solution

Grace United Methodist Church administrators contacted Rutt's Heating & AC, a Trane Strategic Partner, for assistance. After a like-for-like replacement of the church's system was evaluated and deemed too costly, the HVAC contractor and Trane proposed an alternative solution, a Trane Advantage VRF™ (Variable Refrigerant System). Eliminating the need for replacement chillers and ductwork installation, the Advantage VRF offered a less costly way to handle the church's comfort needs, while also helping to reduce utility costs.



The Grace United Methodist Church facility consists of a spacious church for worship services, connected to a building housing its offices, daycare, Sunday school and nursery, with later additions including a kitchen, gym and music room.

An innovative, exceptionally quiet comfort process

Two Trane Advantage VRF systems, which included twenty-nine indoor and four outdoor units, were installed on the daycare/Sunday school building. Rather than moving heated or cooled air throughout the interior of a building like many traditional systems, the Trane Advantage VRF system quietly moves heated or cooled refrigerant throughout the interior of a building using small-diameter pipes. The refrigerant then passes through coils in each room being served and fans move air past the coils. The fans, with sound levels as low as 23dBA, transfer warmed or cooled air into the rooms, enhancing comfort and the learning environment.

Less impact on structure and aesthetics

With a small footprint and an appealing look, the Advantage VRF™ units have less impact on the existing church structure. Bottom accessible controls allowed the units to be mounted in the ceiling, so as not to detract from the building aesthetics. Due to cold temperatures in Nebraska, the outdoor units were installed indoors in a mechanical closet and connected to a damper/duct system to maintain the ambient temperatures.

A high-performance, high-efficiency design

The innovative compressor technology of the Advantage VRF provides efficiency, reliability and longevity. The high performance variable speed compressors precisely match their output to demand levels, maximizing comfort and minimizing energy consumption. The VRF's efficient, asymmetric scroll design with vapor injection increases refrigerant flow rate and heating capacity by up to 20 percent. Advantage VRF in heat pump configuration uses compressors in conjunction with evaporative and condensing coils to move energy, cooling the building in the summer and heating it in winter.

Individual unit controls maintain desired temperatures

The Advantage VRF maintains precise and consistent temperature control over all spaces. Individual thermostats on each unit maintain occupants' desired temperature levels, providing exceptional comfort to serve the diverse occupancy patterns of the daycare, Sunday school and activity rooms.

Central system controls ensure maximum energy savings

The entire Advantage VRF system can be controlled from a personal computer in the church offices or even remotely



The Advantage VRF offers a small footprint, appealing look and innovative compressor technology for efficiency and reliability.

over the internet. The church office manager programs schedules of operation for each unit to ensure the maximum possible energy savings based on time of day and building occupancy. The central system controls also allow monitoring of system operation and alarm history management.

Results

Providing consistent temperatures, increased reliability and quiet operation, Trane Advantage VRF systems installed on the daycare/Sunday school building at Grace United Methodist Church have improved comfort for the church staff, congregation and visitors. The Advantage VRF systems are also helping the church reduce energy costs. "With the Advantage VRF systems, we're able to provide comfort in spaces our old equipment couldn't reach," said Denise Hauff, Grace United Methodist Church office manager. "We are also able to control the various zones, shutting off areas not in use and turning them on before Sunday activities. It's all easy to control right from my desk. Plus, the units are a lot quieter, which is nice for our church activities."



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