

COMPLETION DATE

March 2016

PROJECT TEAM

Architect

Arquitechne S.A., Panama

Distributor and Mechanical Contractor

COPANAC, Panama

CHALLENGE

Adding cooling to a centuries-old church without disrupting its infrastructure or beauty

SOLUTION

Mitsubishi Electric VRF

RESULT

Undisrupted architecture and a space that is comfortable year-round

The Church of Saint Francis of Assisi is one of the oldest churches in Panama, **dating back to the 1700s**. More recently the church sat closed for 12 years – and completely abandoned for nine – due to lack of maintenance. Not wanting to lose this valuable building to deterioration, volunteers with Amigos Iglesias Casco Antiguo began a conservation project. When the community then backed its beloved church with funding, the conservation project turned into a comprehensive rescue, restoring the church to the beautiful, usable space it once was. A significant part of that rescue involved installing an effective, reliable HVAC system. Variable Refrigerant Flow (VRF) from Mitsubishi Electric Cooling & Heating (Mitsubishi Electric) was selected and has made a huge difference for the church and, in turn, the community.

Manuel Choy is an architect with Panama's Arquitechne S.A. – an expert in restoration projects. He explained how important the renovation was and how high the stakes were. "This church is part of our national history. It is also on the UNESCO World Heritage list, which means there are many restrictions on what kinds of restoration can take place. The initial plan was to repair the roof, structure and cracks, and strengthen the building. During this process, the idea of installing an air-conditioning system was conceived." **The selected system would have to solve a lot of problems across the church's 12,000+ square feet. None of the spaces had ever had air conditioning – not the main area, which seats about 500 people, nor the choral area, amphitheater, crypt or vestry.**

Ricardo Gago Salinero, committee president, Amigos Iglesias Casco Antiguo, said, "The toughest part was that we could not, for any reason, cut the walls. We just couldn't do it. **The church could allow most any other solution, just not cutting the walls.'** The

selected system would have to be unobtrusive to the infrastructure and look/experience of the church. That meant small ductwork, small indoor and outdoor units, and a low sound level.

The building's structural design and fragility presented additional challenges. Since the building is very old, there were space and weight limitations for the outdoor units. And since the ceilings in several places in the church are so high, there was also the issue of thermal stratification.

Father Javier Maña, priest, added, "Because of our climate, there was an urgent need for climate control so we could have a level of comfort conducive to a state of meditation or to enjoying liturgical services. We wanted visitors to be able to enjoy the space. If mechanical systems are too loud, they're distracting." Finally, Choy noted that the new system also had to be "energy-efficient given the high cost of energy here and the church's focus on their budget. **Ultimately, we needed equipment that would save money, consume less and fit with the surroundings.**"

The project team considered air- and water-cooled chillers, but Choy thought VRF might be the answer. "I had previously used VRF for commercial projects such as banks. VRF is aesthetically pleasing and meets LEED® requirements. So we decided to consult with several companies and one offered a good solution."

That company was COPANAC, an HVAC distributor in Panama that also performs contracting work. Adsinar Cajar, owner, believed strongly that VRF was the right answer, and his team put together a presentation explaining all that Mitsubishi Electric VRF would offer. He said, "**The church liked how quiet the VRF system was, and how it could cool**

every part of the building. We were also able to offer an extended warranty, which was important to the church.”

The installation happened quickly, alongside other restoration efforts like putting in new LED lights. The centralized control setup was located in the vestry, from which the church could manage the entire HVAC system.

Since installation, the equipment has been running 24 hours a day, seven days a week. Father Maña said, **“The community is very happy that they can come to the church and be comfortable all day long.”** Cajar added, “You can really feel the difference between the humidity outside the church and the lack of humidity inside the church. Visitors can’t tell where the air conditioning is coming from, but they feel the cold air.”

Choy said, “The success of this project has been that we have a system for this church that offers comfort, is efficient and at the same time respects the aesthetics of the building and its interior. So it’s been great so far, and I would recommend VRF for other projects, especially since the noise level is so low and the church’s energy efficiency has been impressive.”

That efficiency has resulted in comparably low utility bills. Gago is involved with a second church that is quite similar to Saint Francis of Assisi, and that also runs its traditional air-conditioning system 24/7. **Saint Francis of Assisi, however, pays 60 percent less to be comfortable year-round.** Seeing that immense cost savings, the other church is now considering upgrading their traditional system to VRF.

The Panamanian Society of Engineers and Architects also noted the success at Saint Francis of Assisi, nominating the project for an award in its restoration category. Additionally, Choy has recommended Mitsubishi Electric for his firm’s next big restoration project – another church in dire need of air conditioning and facing significant restrictions on what can be installed.

“This church has become a beacon in the city, and now with the Mitsubishi Electric system, it’s going to become the center of everything,” said Gago. Already the church is seeing great interest from the public in being an event space for lectures, weddings and music concerts, and of course as a place for religious gatherings and services. “And every time we have visitors, we bring them to see the system. Its achievements are miraculous.”



“There is a danger with major renovations that you transform your building to fit the air conditioning. In this case, the air conditioning transformed to fit the building.”

- Father Maña, priest



MITSUBISHI ELECTRIC EQUIPMENT INSTALLED

5 PUHY Y-Series Outdoor Units, **14** PEFY Ceiling-concealed Ducted Indoor Units, **7** PFFY Floor-standing Exposed Indoor Units, **2** PKFY Wall-mounted Indoor Units, **1** AE-200A Centralized Controller