YANMAR is making Variable Refrigerant Flow technology greener with natural gas.

By Julia Stone

YANMAR has been manufacturing Variable Refrigerant Flow (VRF) systems since 1987, so the company has been producing reliable, compact, dual- or multi-split systems with quiet heating and cooling capabilities while relying on minimal electricity. The natural gas-powered engine in YANMAR’s natural gas VRF systems offers lower emissions compared to electric systems, making them ideal for schools, office buildings, restaurants, and other commercial applications.

“In terms of maintenance, the customer would be able to save energy as well as benefit from economic savings,” says Eddie Caton, regional sales and service manager at YANMAR America. “We’re not using electricity to drive the components, so the energy consumption is in ounces,” says Eddie Caton, regional sales and service manager at YANMAR America.

Top on energy savings, YANMAR’s VRF systems also provide lower operating costs, increased comfort, and cutting-edge control integration. As a result, YANMAR’s indoor heat pump VRF system has been implemented in schools, office buildings, restaurants, and multi-family complexes.

Natural Gas vs. Electricity

Caton says one of the greatest benefits of using natural gas in the HVAC industry is the low level of emissions. “We believe strongly in natural gas in the United States,” he says. “It’s greater than burning coal to make electricity and we don’t have to send that same transmission loss.”

For the most part, conventional VRF systems use electric power for outdoor units, but YANMAR’s new natural gas VRF systems offers lower emissions, increased comfort, and cutting-edge control integration. As a result, YANMAR’s indoor heat pump VRF system has been implemented in schools, office buildings, restaurants, and multi-family complexes.

Economic Savings

The cost of operating the compressor in gas-powered outdoor units is 7 to 10 cents per hour compared to 10 to 20 cents per hour on electric systems. “The natural gas VRF system has a smaller footprint and it’s quieter,” Mehrvarz says.

Reduced electrical energy consumption

Economic savings you can expect, as well as the estimated payback period: it also provides the internal rate of return and an annual cash flow projection. When Croft analyzed YANMAR’s VRF systems for the new EVOCENTER, Croft says his team conducted cost comparisons and evaluations. They were able to save on project costs by using VRF where a standard variable air-volume (VAV) system would have been less cost-effective—in fact, they ended up by using YANMAR’s VRF system for 75% of the HVAC systems for the building.

Energy Efficiency

YANMAR’s engineering team is in the process of collaborating with ASHRAE to study how to calculate the actual efficiency of their natural gas VRF systems. “There is no official EER efficiency standard for our system because it is not a type of equipment new to the United States, but our unit is 90% efficient in cold weather,” Mehrvarz says. “As far as heat exchange efficiency, YANMAR’s heat pump operates well during cold periods by using waste heat to boost the building’s efficiency. Their system captures the waste heat from the gas-powered engine and returns it into the refrigerant line through the use of a plate heat exchanger. A typical heat pump would require emergency heat strips, but we don’t need them,” Croft says. “We have a plate heat exchanger, which transfers heat back to the refrigerant. So, our recovery time and operating temperature are a lot lower than typical competitors.”

System Integration

Control integrations is simple with YANMAR’s VRF system. “Because we partner with Daikin, all of our outdoor controls and Daikin controls, Mehrvarz says, “We’re able to provide control for the HVAC system, as well as integration with any building management system using our open protocol with a BACnet to LonWorks interface.”

YANMAR’s system monitoring, control helps with troubleshooting and preventative maintenance. It can connect to multiple outdoor units, and if any errors are detected, the system will send alerts to YANMAR’s service staff, so they can address the issue before the customer even realizes something is wrong. Mehrvarz says. The remote monitoring control allows YANMAR’s VRF systems performance, such as the level of condenser hours of operations, and the speed RPM and temperature.

Easy Installation & Maintenance

YANMAR’s new EVO//CENTR incorporates a VRF system, which considerably reduced building operating costs.

The Future of VRF