

GAS HEAT PUMPS (GHP) VARIABLE REFRIGERANT FLOW (VRF)



BATES HALL, UNIVERSITY OF BRIDGEPORT

Bates Hall was a building that had been sitting empty for some time. It was being renovated to be the new president's office. Bates Hall has 17 zones and is over 3000sq ft. We installed two outdoor VRF units (8 ton & 6 ton) with three-pipe heat recovery, split coil heat exchanger, intelligent duty cycle and quiet operation. Also included were 3 - DC Inverter Heat Recovery Units, 3 wall mounted ductless splits units; 4 cassettes, allowing for 360-degree airflow with low profiles and interior controls.

The Lennox VRF effortlessly integrated with a Johnson Controls System that allowed for monitoring and management of the VRF system. The JCI controls system has 18 zone thermostat controls and 1 BAC-NET FX-30 web-based interface.

BAUER HALL, UNIVERSITY OF BRIDGEPORT

We recently installed two mounted 12-ton outdoor units and 23 indoor units. Six indoor units were floor standing, 1 ductless split and 17 were ceiling cassettes. We also installed 2 indoor mounted energy recovery ventilators.

This system was integrated with a Johnson Controls FX-80 Supervisory front end controlled with a web based interface and a BAC-NET gateway.

760 RIVER RD, SHELTON

The River Road project is a new construction office complex. They wanted to provide comfort, efficiency and



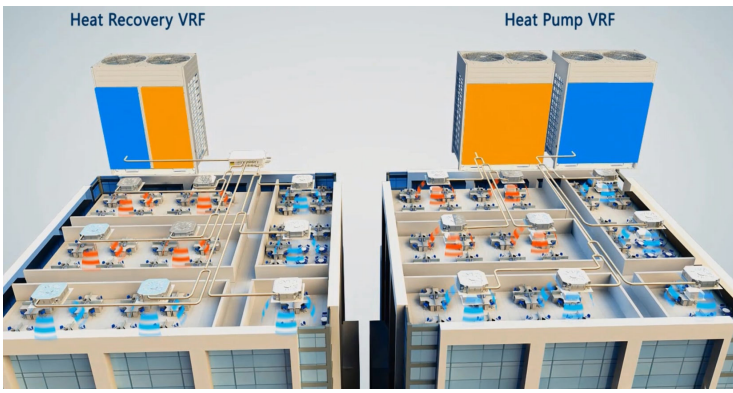
temperature management to all office locations. It was a custom design build project where we performed all calculations and engineering required. We installed a VRF system with variable speed compressors for heating and cooling on demand with heat recovery.

The variable refrigerant flow (VRF) heat recovery system serves the parking level, ground floor, 2nd floor and 3rd floor. The installed system includes 10 VRF Heat Recovery outdoor condenser units; 34 Med Static ducted indoor units; and 108 indoor Cassettes varying in size between 2x2 and 3x3 with a compact 360-degree airflow design for uniform air distribution.

Additionally we installed a dedicated outside air system that supplies the required fresh air to the indoor VRF units and recovers the energy from the exhaust air.

The system includes two (2) AAON RN 25 rooftop units with energy recovery wheel, digital compressor, high turndown natural gas heat section with stainless steel heat exchanger, variable speed condenser fans with head pressure control, modulating hot gas reheat and nonfused disconnect switch.

A Johnson Controls system with a FX-80 web-based user interface supervisory front-end controller will control the two AAON rooftop dedicated outdoor air units and monitor the temperature in the areas served by the four ductless splits. Additionally the BMS will monitor the VRF system, and act as a gateway for remote connection, monitoring and trouble shooting.



WHAT ARE THE BENEFITS?

VRF Systems are 20%-25% more efficient than conventional systems. VRF systems do have additional upfront costs, but these can be offset by lower energy bills and repair expenses over time, as well as through increased occupant comfort.

Individual zone control: No matter how your building is used, this customizable solution allows you to control different comfort needs independently. This leads to a reduction in complaints that offices are either too hot or too cold, since offices can have individualized controls. Unused rooms' climate controls can be switched off entirely, lowering your energy bill by not having to pay to heat and cool, unoccupied spaces.

Quiet: In a VRF system, the noisier condensing unit is typically outside, and the indoor air handlers are smaller and quieter than a traditional systems.

Consistent comfort: The VRF HVAC system can detect the precise requirements of each zone, and send the precise amount of refrigerant needed to do the job. As a result, each area of your space is consistently comfortable with well-controlled humidity and no hot or cold spots.

Space: VRF systems take up much less space than forced-air systems, which is a benefit for upgrades in existing structures.

Multiple Control Options: The options are almost limitless with the ability to have up to 16 Zone Levels and up to 128 indoor units per outdoor unit, as well as the ability to have multiple VRF systems and Inter-connectivity to a controls system.

WHAT IS VRF?

Variable Refrigerant Flow, VRF, technology provides the ability for multiple indoor units and/or zones to operate within the same system. VRF allows for variable motor speed thus allowing the refrigerant flow to vary rather than a simple on/off operation. VRF systems only run as much and as often as needed. VRF systems can either be a heat pump or heat recovery system.

The benefit of a heat recovery system is that it allows for simultaneous heating and cooling by absorbing excess heat energy in one zone and transferring it to heat another. This helps provide comfort while operating at maximum efficiency. The heat recovery system allows for localized comfort with independent temperature control. Every occupant can enjoy a perfectly heated, cooled, and dehumidified area. VRF is a flexible system in operation and installation. Multiple configurations of indoor units are available, including wall and floor mounts.

Energy savings up to 55% have been found with ROI as fast as 2 years!

VRF APPLICATIONS

Perfect applications for VRF include: Office Buildings, Lodging, Healthcare, Multi-family structure, Hospitals, Education, Retail and Dining. It is equally suited for new building or upgrades in an existing building.

Financing/Rebates can work with CPACE financing.

CONTROLLED AIR

Controlled Air, was founded in 1980, as a family-owned and operated heating, ventilation, air conditioning and temperature controls company with 108 employees. We continue to be at the forefront of technology, bringing sophisticated and energy efficient solutions to the challenges of today's complex applications.

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21 Thompson Road . Branford, Connecticut 06405 . PHONE 203-481-3531 . FAX 203-481-3533

CT S1 License 302788 . RI R/M 1 & P/M 00007776 . www.controlledair.com . controlledair@controlledair.com