

BLUEPRINT

SHERATON CENTRE TORONTO TORONTO, ONTARIO, CANADA



sheratontoronto.com

PROJECT INFORMATION

Building Type: Hotel

Floors: Queen Tower = 43
Richmond Tower = 11

Square Feet:
Approximately
1,500,000 sq. ft. / 139,355 m²

Guest Rooms: 1,373

Building Height: 443 ft. / 135 m

General Contractor:
Gillam Group Inc.
East York, Ontario, Canada

Mechanical Contractor:
Modern Niagara
Toronto, Ontario, Canada

Consulting Engineer:
M & E Engineering Ltd.
Concord, Ontario, Canada

CHALLENGE:

The existing two-pipe chiller system only allowed for either heating or cooling. The system was deteriorating and not providing the ability to heat and cool rooms independently. A replacement system was required to integrate with existing building controls, and comply with CSA B52 refrigerant limitations.

SOLUTION:

The Sheraton Centre Toronto decided to install a Daikin VRV system. The decision was based on the system's ability to operate in heating and cooling modes simultaneously between guest suites. The Daikin VRV system also operates at lower sound levels, and provided a competitive total installation cost compared to other options.

The Sheraton Centre Toronto Hotel consists of two main buildings — the 43-floor Queen Tower and the 11-floor Richmond Tower. These two buildings share a common lobby and a connecting concourse at the 2nd floor. The busy downtown Toronto hotel underwent an extensive \$120 million renovation of the entire property, including all guest rooms, suites, conference rooms and public areas. The existing two-pipe fan coil system was replaced with Daikin VRV water-cooled heat recovery systems.

Three Daikin VRV water-cooled systems, with two condensing units each, were installed for every two floors. This provides approximately 20 tons of heating and cooling per floor. Ten Daikin VRV air-cooled heat recovery condensing units were also installed on the roof for 54 of the 1,373 guest suites. The refrigerant piping layout is very similar for both the water and air-cooled systems. Each pair of condensing units forms one system, offering redundancy. Each system contains three refrigerant lines installed above the hallway ceilings with a tee off into each guest suite. The lines are connected to a small single-port branch selector box installed next to the fan coil in the bathroom ceiling. All suites are retrofitted with 8-inch tall slim duct fan coils, with precisely balanced direct-drive fan assemblies. The installation fits nicely above the ceiling, just outside the tub/shower area. The Daikin VRV systems

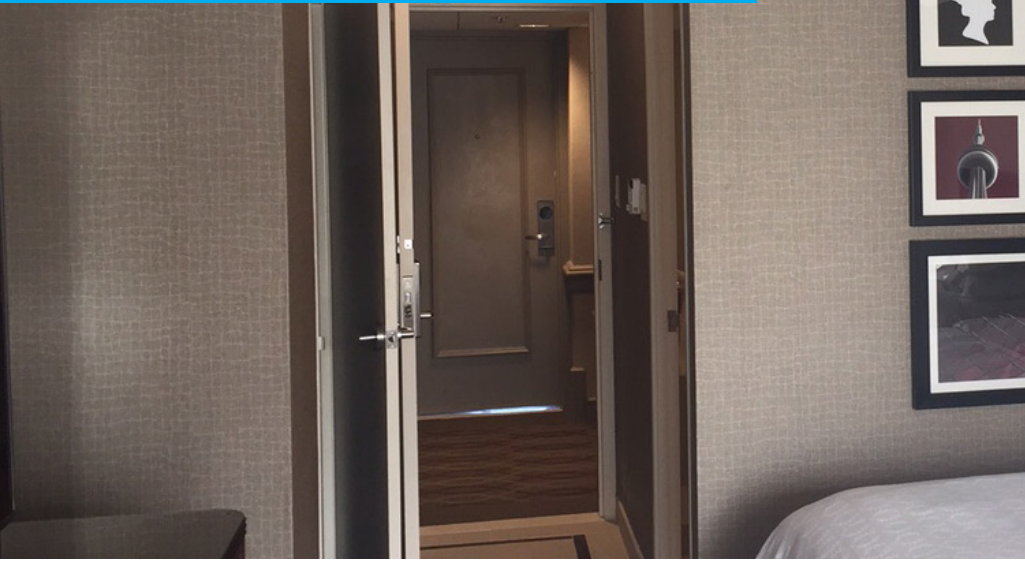
provide simultaneous heating and cooling (heat recovery) between guest suites. When some guest suites are in heating mode, others can operate simultaneously in cooling mode. Additionally, there is a second level of heat recovery on the water-side with the Daikin VRV water-cooled systems.

Daikin VRV air-cooled heat recovery systems provide simultaneous heating and cooling from a single outdoor condensing unit to multiple indoor fan coils and have an extended heating capacity operating range down to -13°F (-25°C) as standard. The unit is engineered and optimized for Total Cost of Construction (TCC) and Life Cycle Cost (LCC) and part load efficiencies are optimized using dedicated all-inverter compressors and inverter fan motors. *Continued on next page.*



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DAIKIN EQUIPMENT

- 136 VRV-III Water Cooled Heat Recovery Condensing Units
- 10 VRV III Air Cooled Heat Recovery Condensing Units
- 1,380 Indoor Slim Duct Concealed Units
- 35 Indoor Wall Mounted Units
- 1,380 Branch Boxes
- 1,373 INNCOM Honeywell Thermostats
- 1,373 PC-RTD INNCOM Interface Adapters
- 35 BRC1E73 Navigation Remote Controllers
- 8 DMS502B71 DIII-NET BACnet Interface

This allowed engineers to design air-cooled VRV systems without any back-up heating, as long as the condensing unit's size met the heating load at the design temperature. The heating design temperature used on this project was -4°F.

Daikin partnered with INNCOM® to integrate with the hotel's existing building management system. The joint development included the installation of INNCOM thermostats wired to VRV indoor units via a PC-RTD adapter. The adapter provides INNCOM thermostats with 8 points to monitor and control the indoor units in each suite without the loss of Proportional Integrated Derivative (PID) control or system efficiencies. Thermostats in each suite react to the rental and occupancy status of the suite. The combined technology of INNCOM and Daikin VRV provide cooling and heating only when and where it is required. The combined INNCOM energy management and Daikin VRV Heat Recovery systems maintain a quiet, comfortable room temperature, while ensuring maximum operation and efficiency are fully achieved.

12-ton and 14-ton dual module systems, along with single port branch selector boxes with Refnet® piping joints (no headers), keeps refrigerant charge low and in compliance with CSA B52 refrigerant limitations. For the air-cooled systems, a refrigerant riser from the roof-mounted units serves each system's respective floor.

In the Queen tower, existing storage room areas on each floor were converted to small mechanical rooms. In the Richmond tower, ice machine rooms were remodeled to allow space for both the ice machine and a mechanical closet. The mechanical closet houses the stacked VRV water-cooled condensing units. The hotel's existing condenser water lines, which run from the basement mechanical room to the roof-mounted cooling towers, are used to feed the VRV water-cooled condensing units on each floor.

FIND OUT MORE ABOUT DAIKIN VRV.

Contact your local dealer or manufacturer's representative.

Additional information.

Before purchasing this appliance, read important information about its estimated annual energy consumption, yearly operating cost, or energy efficiency rating that is available from your retailer.

Actual savings and costs will vary. Cost and savings statements are applicable solely to the installation indicated. For additional information please contact the installing contractor, distributor or factory representatives.



Our continuing commitment to quality products may mean a change in specifications without notice.

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