Therm Gas Condensing Tankless Water Heaters
The Caroline Residential Building in New York Case Study

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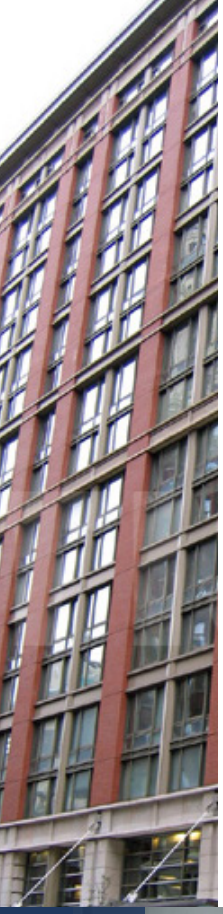
Energy Saving Therm Tankless Water Heaters
in Multi-Family Residential Application

Project Goals:
- Energy Savings
- Space-saving Technology
- Reliable Retrofit

Background
The Caroline is one of the most prestigious residential apartment buildings in New York City, located in The Flatiron district on 23rd Street, between 5th and 6th Avenues. The 20-story building features 433 apartments with premium kitchen and bath amenities, 50-foot sky-lit swimming pool, on-site laundry, fitness center and central climate control. Built in 2000, the building used a central hot water delivery system using four commercial direct fired water heaters. After 12 years, one of the water heaters failed and the existing DHW system was not meeting the demands of the tenants and needed replacement.

Installation Summary
The building owners were looking to upgrade their DHW system but were challenged with space constraints for new equipment and variable loading due to changing occupancy. Adding additional storage capacity was not an option as the mechanical room was already filled to the maximum. They opted to install 17 Bosch C 1210 ESC condensing gas tankless water heaters cascaded in parallel for a tank loading application. Two zones were required for DHW – lower zone with eleven C 1210 ESC units and five storage tanks and upper zone with six C 1210 ESC units and three storage tanks (each storage tank has 240 gallon capacity). This commercial series tankless unit is the only one that can operate at over 140°F outlet water temperature and still be vented with PVC.



Tankless water heaters are commonly used in residential on-demand applications. However tankless water heaters can be applied in a commercial tank loading application providing comfort even with variable demand. An advantage of using the Bosch tankless units was that they fit through a standard 30-inch doorway, and they function with the lower gas pressure available in the building.

Up to 24 Bosch C 1210 ESC gas tankless water heaters can be linked together to achieve higher flow rates than with single units – up to 290 gallons per minute. The 17-unit cascade used in The Caroline can deliver 205 gallons per minute.

Commercial tank loading design allows for complete isolation of the system for maintenance and gives the ability to bypass certain system components in case of failure.

Some design consideration for tank loading include:

- Ensure flow through each water heater is between 3.5-5.0 gpm
- Isolation valves or boiler drains should be installed to facilitate descaling in applications with hard water
- Whenever possible, plumb the system or configure the tank to draw cold supply water into the water heater during hot water use

Summary and Conclusion

Unlike conventional water heaters, these condensing units capture latent heat from condensation of the exhaust gas and use it to preheat the incoming cold water, making Bosch condensing tankless water heaters 10% more efficient than traditional tankless water heaters.

The building owners are very pleased with the performance, energy savings and flexibility of the THERM C 1210 ESC condensing tankless water heaters, and not a single day of hot water supply was lost during installation.

Project Name:

- The Caroline residential building, New York, NY
  www.thecarolineny.com

Building **Owner**:

- Pan Am Equities LLC, New York City

Application:

- Gas condensing tankless water heaters

Equipment:

- 17 Therm C 1210 ESC cascaded in parallel

Intallating Contractor:

- Paramount Plumbing, The Bronx, New York

Manufacturer's Representative:

- Jordan Stern, Marplat, Westbury, NY

Project Completion:

- August 2012

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