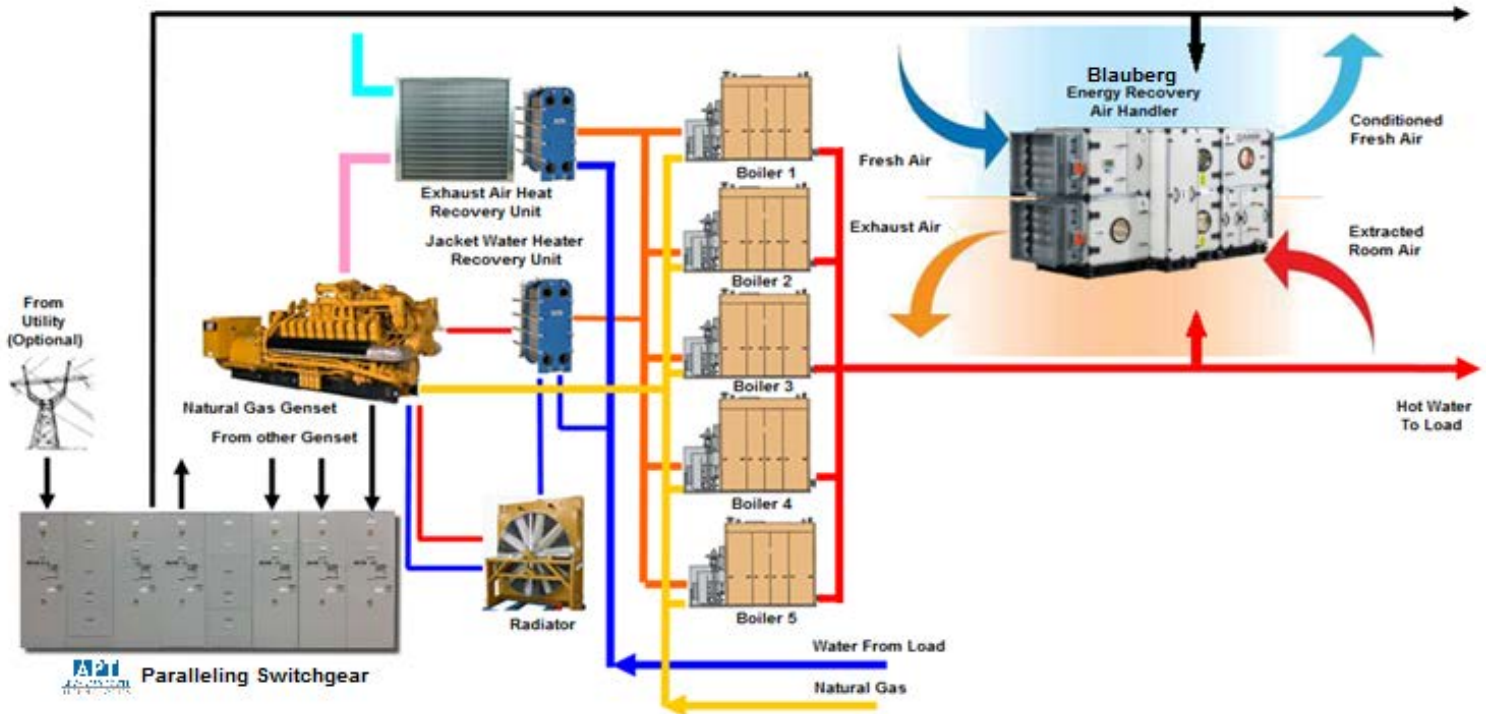


Integrated Power & Air for Buildings



CHPA – Combined Heat, Power, & Air Systems for Efficient & Sustainable Buildings of the 21st Century

CHP Systems Overview:

Combined Heat and Power (CHP, Cogeneration) microgrids increase Energy Efficiency and Reliability and allow our customers to generate heat and power on-site. Addition of heat recovery increases typical electrical output efficiencies in the range of 30% to 42% to the overall CHP system efficiency of up to 83%. Natural gas, biogas, bi-fuel or diesel driven generator sets can be combined with [APT EnerStore battery storage systems](#), APT Grid Isolation Co-gen Island Support Generators, solar panels and other renewable sources of power to create efficient, sustainable and ultra-reliable [microgrids](#) to meet specific customer needs or objectives. Natural gas, bio-gas, bi-fuel, diesel, energy storage and renewables driven generation is controlled, monitored and protected by [APT Automatic Paralleling](#) and [Load Transfer switchgear](#).

APT Grid Isolation Cogen Island Support Generators, when added to the cogeneration system, offers the following benefits:

- Establishes isolated co-gen microgrid system while maintaining the utility grid as one of the power sources
- Entirely eliminate the lengthy process and significant cost of the Utility Interconnection
- Stabilize frequency of the gas driven generators, when operating in the island mode, separated from the utility grid
- Improve transient response and black start capability of the gas driven generators, when operating in the island mode, separated from the utility grid
- Seamless and bumpless closed transition load transfer between the co-gen microgrid and the utility grid
- Eliminate nuisance tripping of cogeneration system due to the utility faults, utility voltage fluctuations, and upstream reclosing operations
- Complete galvanic isolation of the co-gen microgrid load from the power source. This prevents any over-voltages and surges on the utility side from damaging loads connected to the co-gen microgrid side of the system.

Modern natural gas and biogas engines are designed to optimize the fuel efficiency and emissions compliance. This comes at a cost of poor transient response when operated separately from the utility grid. This makes most of these units ineffective when black start capability or island operation is required. APT Grid Isolation Co-gen Island Support Generators and [APT EnerStore battery storage systems](#) allow for the high-efficiency natural gas and biogas-powered engine-generators to be used for island and black start operation.

Microgrid Sustainable Power Systems

Start Building the Smart Communities of Tomorrow... Today with APT's Microgrid Control & Power Management Technologies

