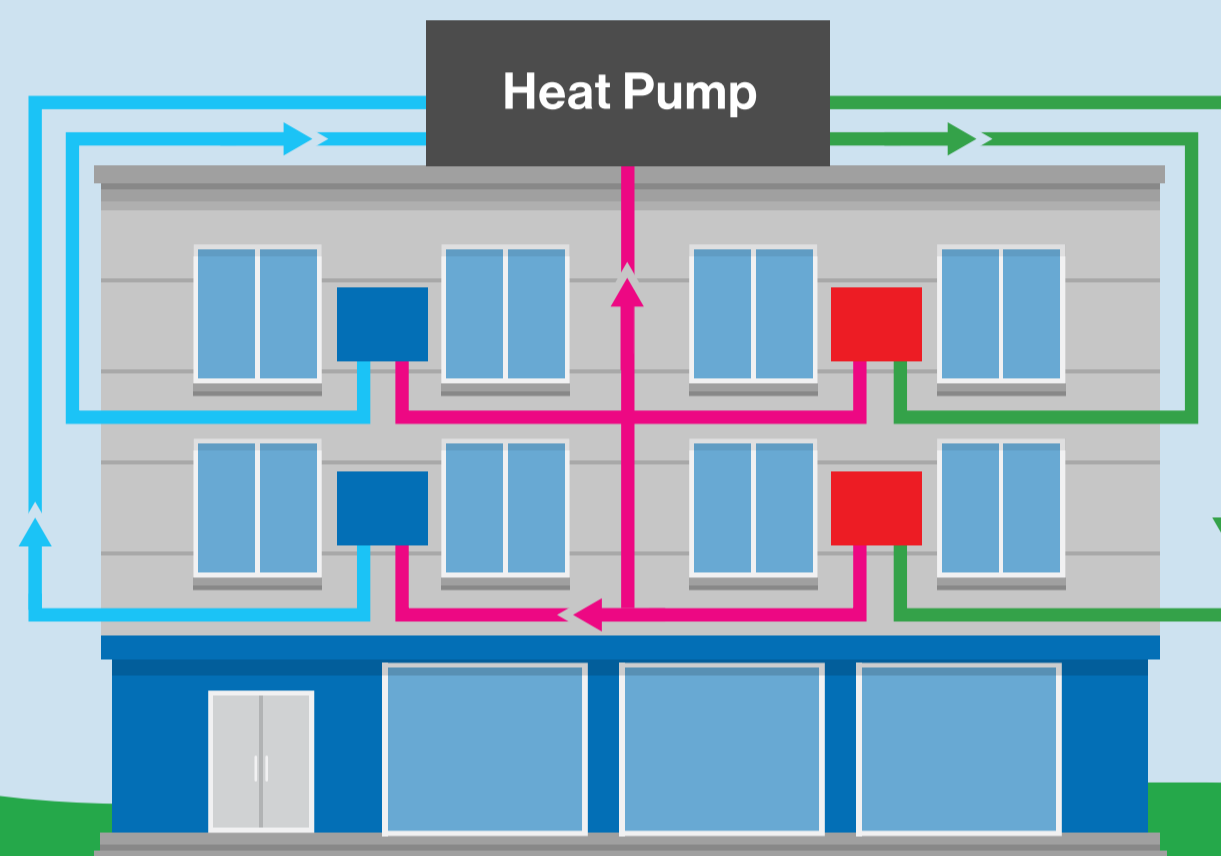


Variable Refrigerant Flow (VRF) Heat Pumps

VRF systems move thermal energy around the building using refrigerant instead of a more traditional hydronic loop. This allows a set of high-efficiency air source heat pumps to supply both heating and cooling energy to the whole building.

Each unit or space contains an indoor unit that can be similar to a mini-split or embedded in the ceiling or wall. The indoor unit outputs warm or cool air and can be individually controlled.

- High Pressure Gas
- High Pressure Liquid
- Low Pressure Gas



Pros & Cons

As a relatively complicated system, the capital cost for VRFs is generally high. Premium VRF systems operate at high efficiency in most seasons, resulting in low energy costs.

Due to the refrigerant loop, VRF systems can limit future fuel flexibility – while a hydronic system could easily change boiler fuels or use a water-to-air heat pump, VRF system components are not interchangeable.

System	Capital Cost	Energy Cost	Suite Noise	Floor Space Impacted	Submetering	Fuel Flexibility	Temperature Control
VRF	Moderate	Low	Low	Central System	Expensive	None	Unknown