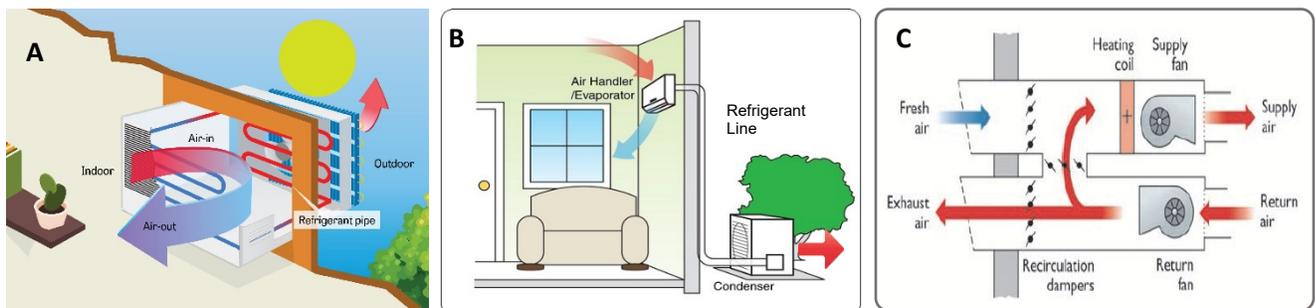


## Air Conditioner Fact Sheet

Air conditioning (AC) units typically consist of a compressor, fan, evaporator coils, and compressor coils. While window units house all components within a single box (Fig. 1A), other types of AC units typically have an outdoor component as well as an indoor component, called a split system (Fig 1B). In split units, the outdoor component contains the compressor, fan, and the condenser coils, while the indoor air handling unit contains the evaporator coils and a fan. The interior and exterior components are connected by a series of tubes which carry refrigerant that cycles between them. A common misconception is that AC units increase ventilation to a space by bringing in fresh air from the outside, however most AC units work by re-circulating air already within the space. Central AC units in industrial and commercial buildings can bring in a variable amount of outside air (Figure 1C). This is typically kept to a minimum for purposes of humidity control and energy efficiency, however, these units can be made to supply 100% outside air if needed. For more information on how to increase ventilation, please refer to the [Ventilation Guidelines Fact Sheet](#).



**Figure 1.** Schematic diagram of directional airflow in three kinds of AC systems; a window unit (A), ductless split unit (B), and within the ductwork of a central air system (C).

AC units cool the air by removing heat from the indoor air. A motorized fan pulls air from the room into the interior air handling unit. Refrigerant is then pumped from the exterior compressor coil to the interior evaporator coil, where it absorbs the heat from the air before pushing the cooled air back into the room. With central air, the interior air handler is usually located out of sight and the cooled air is distributed throughout the building through vents which are connected by a series of ductwork. Air handlers used in ductless split systems are typically hung high on the wall and provide cooled air for only the room that they are in (Fig. 1B).

**Importantly, use of window or split AC units do not increase ventilation in a space**, which can be problematic when bioaerosol transmission or improving indoor air quality are concerns, especially in a shared space that has no source of ventilation. Risk of aerosol transmission can be mitigated and indoor air quality can be improved by increasing ventilation (i.e. bringing in a fresh source of air usually from outdoors) and decreasing occupancy in a space or removing the source of contaminants. Since space is limited, often we rely on ventilation as a means of control. ***In shared spaces with no ventilation, AC units should not be used when possible to decrease the risk of aerosol transmission.*** Although window AC units in “fan only” mode do bring a small amount of outdoor air into the space, the amount brought in is very minor due to the small opening on the backs of these units and does very little to alleviate aerosol transmission concerns. Split units are not capable of providing any fresh air and only recirculate. Opening up windows and allowing outside air to come in increases ventilation in a space, while running window or split AC units only recirculate indoor air and increases the risk of aerosol transmission in that space.

If you have any questions about ventilation or indoor air quality, please contact EH&S at [askehs@umass.edu](mailto:askehs@umass.edu).