

Miller Learning Center (0081)

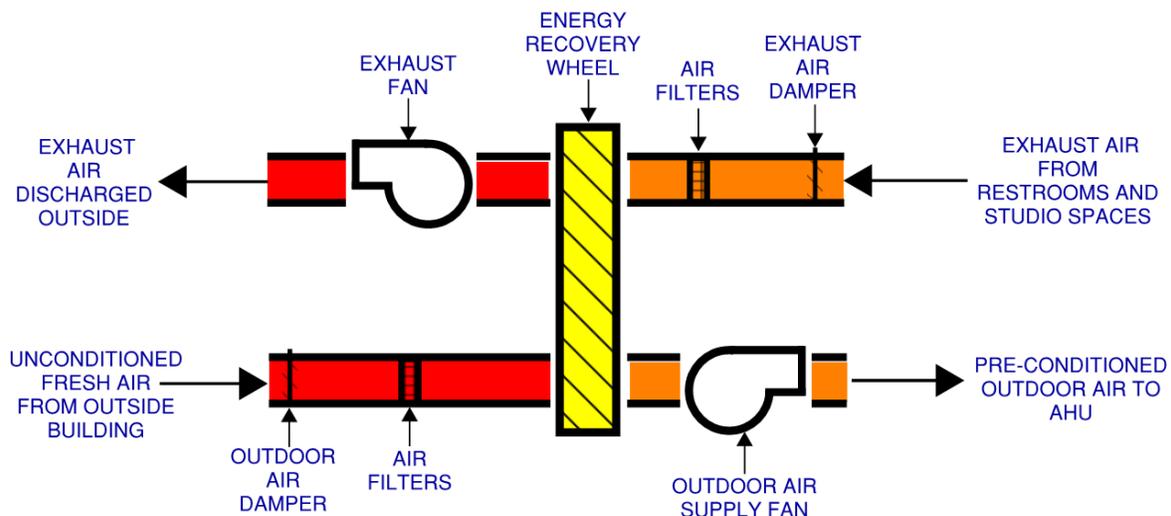
The Miller Learning Center, built in 2003, is primarily served by a variable air volume (VAV) system comprised of two air handling units (AHUs): one for the west end of the building and one for the east. The two units operate in parallel to supply air throughout the building zones, where airflow and temperature are adjusted by each zone's thermostat. The AHUs pull recirculated air from the four floors of the building and mix it with outside air brought in through openings in the roof. They pass the mixed air through a wall of filters, add heating or cooling/dehumidification as necessary, and push it into the supply ductwork.

A portion of the outside air supply is pre-conditioned in an energy recovery unit (ERU) that transfers energy from the bathroom exhaust air. When outdoor air conditions are cool enough, the AHUs can switch to "economizer mode" by bringing in more fresh air and exhausting the return air, thereby avoiding the need for mechanical cooling and dehumidification.

Chilled water is supplied throughout the building from a chiller located in the mechanical room or from the campus chilled water system. Heating hot water, distributed throughout the building for heating, is provided by a steam to water heat exchanger using steam from the campus steam system.

ENERGY RECOVERY VENTILATION UNIT

Ventilation and building exhaust is provided by energy recovery ventilation units located in the attic. The energy recovery units (ERUs) pre-condition the incoming outdoor air using a total energy recovery wheel that is exposed to the outdoor airstream flowing into the building and the exhaust airstream leaving the building. Exhaust air is drawn through the building via ductwork by fans in the ERU where it passes through a filter bank and then through a turning energy recovery wheel that transfers both sensible and latent heat to/from the exhaust air stream. The incoming outdoor air is drawn through the ERU via fans within the unit where it passes through a filter bank and the turning total energy recovery wheel to be pre-conditioned with energy transferred from the exhaust air stream. The pre-conditioned outdoor air is then supplied to the corresponding AHU.



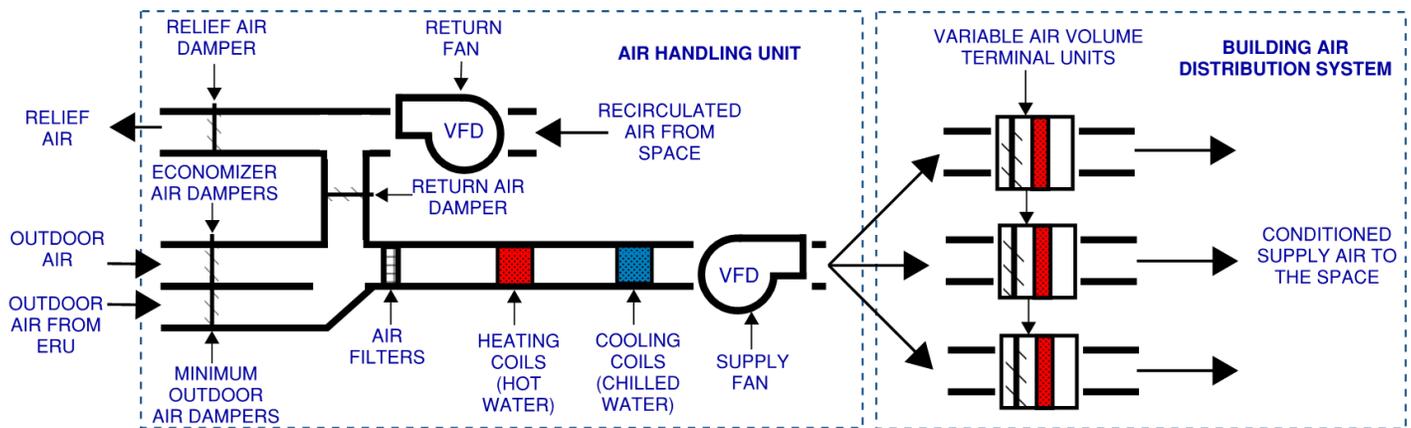
ENERGY RECOVERY UNIT SCHEMATIC

VARIABLE VOLUME AIR HANDLING UNITS

The air handling units deliver a variable volume of conditioned air consisting of a mixture of recirculated building air and fresh air from outside of the building. The return air is filtered, mixed with outdoor air and cooled with chilled water coils in the air handling units before being supplied to rooms throughout the building via above ceiling ductwork.

Duct mounted, variable air volume zone terminal units (VAVs) are equipped with an air damper to regulate the volume of air delivered from the central AHUs to the space and a hot water coil to provide heating to individual spaces based on the zone temperatures. VAVs are located throughout the building in the above ceiling ductwork and provide the means to switch between cooling and heating modes of operation in individual spaces within the building.

Air is recirculated from the building back to the air handling unit through ceiling mounted air return registers located in each space. Return air is pulled from a plenum space above the ceiling. Exhaust is provided in restrooms on each floor to remove odors and to maintain a slightly positive building pressurization.



VARIABLE VOLUME AIR HANDLING UNIT SCHEMATIC