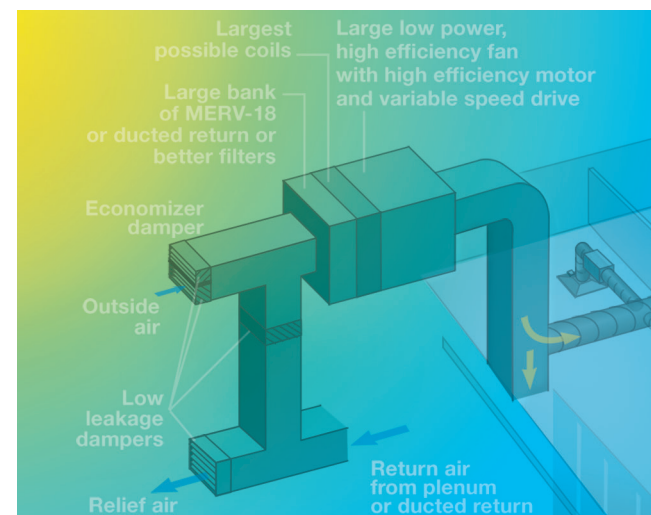




# High Performance Air Systems

An AMCA International White Paper



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# High Performance Air Systems

**Ducted HPASs offer significant benefits over ductless systems**

## ABSTRACT

This paper will show that ducted high performance air systems (HPASs), when compared to ductless water/refrigerant-based systems, offer the following benefits:

- Higher efficiency
- Lower first and life cycle costs
- Minimal refrigerant risk
- Better environmental comfort
- Better air filtration
- Quieter
- Easier to adapt to a new layout
- Safer and easier to maintain
- System component performance third-party certified by AMCA and AHRI

## INTRODUCTION TO DUCTLESS AND DUCTED SYSTEMS

The following section briefly describes the difference between ducted and ductless systems currently available for installation.

### DUCTLESS HVAC:

#### ONE SYSTEM FOR HEATING/COOLING, ANOTHER FOR VENTILATION

Ductless systems use a refrigerant- or water-based piped system for zone heating and cooling. They also have a second ventilation air system to meet outside-air code requirements.



High performance air systems optimize energy efficiency, comfort and indoor air quality.

Ductless system heating and cooling technologies include

- Variable refrigerant flow (VRF)
- Ground source heat pumps (GSHPs). Note that GSHP systems also can be connected to ducted systems.
- Water source heat pumps (WSHPs)
- Chilled beams
- Fan coil units (FCUs). Note that an FCU can be used for heating, cooling and/or ventilation.

Ductless system ventilation technologies include

- Dedicated outside air systems (DOASs)
- FCUs
- Active chilled beams with integrated fresh air inlet

Common applications for ductless installations include

- Existing ductless structures, such as masonry buildings, where ducting may be expensive to add
- Multi-family housing, dormitories and hotel applications where a common air return is not permitted
- Mixed-use facilities with different zone requirements (for example, with a ducted system serving common hospital areas and a ductless system serving patient rooms)

## VRF System

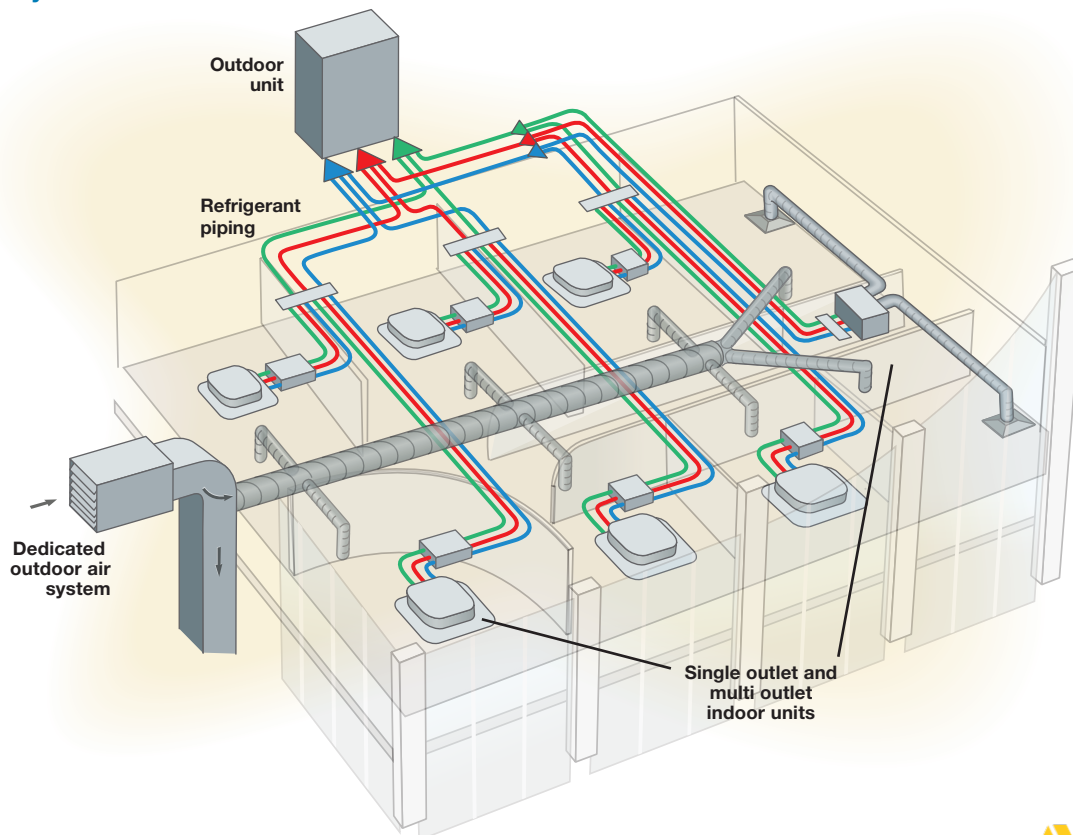


Figure 1: A system using variable refrigerant flow for heating and cooling and a dedicated outdoor air system for ventilation