

Anemostat's line of **Replace-N-Save** retrofit kits and valves, benefit both the building owner and facilities personnel responsible for maintaining the HVAC system and paying the electric bill.

Buildings constructed using air terminals with pre-1975 technology probably consist of either a single duct or dual duct constant volume system. These constant volume air terminals are tremendous workhorses, but unfortunately, they are also tremendous users of energy, due to their design and high operating pressures. Anemostat provides both internal and external retrofit solutions where the existing air terminals can be upgraded at a significantly lower cost as compared to a complete "tear-out & re-install" of new equipment. Good reasons to consider retrofitting an existing system:

**1. Occupancy comfort / health / productivity**

Older units are subject to wear and deterioration as is any equipment of the same age. This may mean that the original design intent and system capacities are no longer being satisfied. Poor productivity or high incidence of occupant illness may be related to poor thermal comfort and ventilation rates caused by equipment failure or lack of performance.

**2. Energy Costs**

Energy costs will never go down – the only way to combat increases in energy is with increased efficiency.

**3. Minimized Disruption**

External retrofits require minimal duct disturbance. Internal retrofits typically can be completed in less than 60 minutes, working through the access door in the bottom of the air terminal. Total building retrofit can be staged and completed during unoccupied hours, often by the building maintenance staff.

**4. Equipment depreciation**

Any tax depreciation benefit from the original equipment is long gone.

**Energy Savings Analysis**

In a conventional, constant volume dual duct air terminal with a mechanical constant volume regulator, the cold air capacity varies inversely to the hot capacity. Therefore, as the space temperature drops, the cold supply air capacity decreases and simultaneously the warm air flow rate increases and the total CFM delivered to the space is constant, see diagram 6. An Anemostat internal retrofit kit will reduce the capacities required for temperature control, while reducing the operating pressure requirements. Retrofit control loops are typically sequenced with the existing inlet dampers and a multitude of control strategies are possible. As the space temperature drops, the cold air volume is decreased to minimum capacity before the warm air damper opens. Thus, most of the temperature control is achieved by operating the air terminal with a variable capacity between minimum and 100% of the design capacity. Based on heating loads, the hot air volume may stay at minimum flow (diagram 7), or a dual maximum strategy can be utilized (diagram 8).

Energy savings occur with Anemostat retrofit kits because of reduced air flow rates, reduced operating pressures, and the elimination or reduction of simultaneous mixing of hot and cold air flows. With a typical operating setpoint at 75% flow through the cold duct, the fan discharge pressure can be reduced to less than 75% of the design requirements. Also, with a 25% capacity reduction, the fan operating power is reduced by 35%.

Many older constant volume systems may be operated as variable volume systems, with considerable energy savings, without any loss of occupant comfort. The conversion of the existing systems to variable volume often can be accomplished by the building maintenance staff, with minimal disruption to the occupants.

**Typical Dual Duct Terminal  
With Mechanical Constant Volume Regulator**

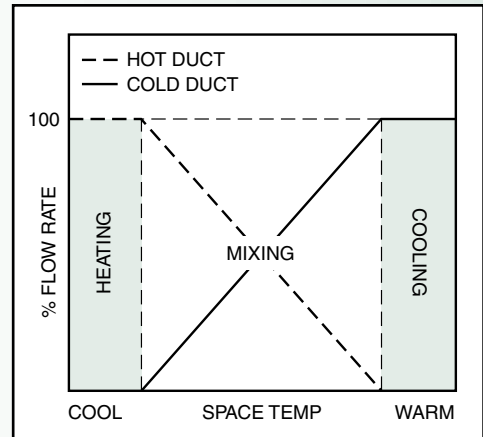


Diagram 6

**Variable Total Air Flow  
With Mixing At Minimum Flow**

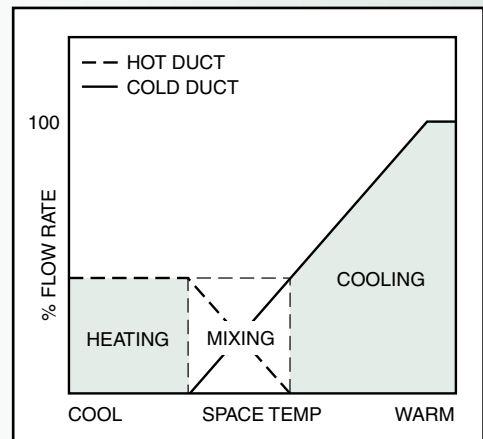


Diagram 7

**Dual Maximum Variable Total Air Flow  
With Mixing At Minimum Flow**

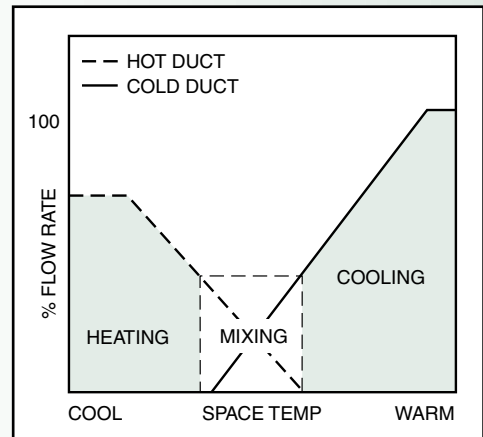


Diagram 8