



Case Study Constant Volume Regulator Central Ventilation

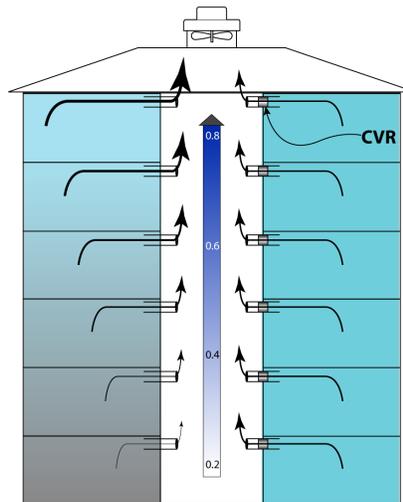
Application: Multi-floor condo or hotel. The bathrooms each have a six (6") inch exhaust grille connected to a common central exhaust chase. There is a rooftop ventilator pulling air out of the chase.

What is going on? Tall Building, whether ventilation is mechanical or natural, static pressure is going to be very different top to bottom. The Stack Effect, ductwork limitations and proximity to the relief will mean that much more air is coming from the upper floors.

Uncontrolled Exhaust

Closer to the exhaust ventilator, the suction pressure is higher so we get more flow close to the equipment. Further from the equipment we are moving very little air.

Spaces at the top of the building may be pulled into a negative pressure condition encouraging outside air infiltration. Lower units may not get enough air changes with the accompanying stuffy, stale and potentially unhealthy indoor air.



Constant Volume Control

The CVR adjusts itself to limit flow regardless of pressure (through its rated range). Therefore we equalize the flow across the rooms. No longer is all of the air coming out of the upper floors. No one is being over-ventilated and no one smells yesterday's onions.

Remember no wires, no sensors, no controllers. CVRs are completely self-contained!

How much Does the CVR Save?

We all agree that clean healthful air is critical but air changes impose a very high cost on building operators. Ventilation intentionally throws conditioned air out the window. That air must be replaced with outside air that must be filtered/warmed/cooled/humidified or dehumidified. That costs BTUs and dollars. The Constant Volume Regulator limits the exhaust to meet the flow required by Ashrae 62.1 or local code.

Flow Rates and Costs - 6" Exhaust Vent				
Static Pressure (inWC)	Uncontrolled Flow (CFM)	Annual Cost to Condition ¹ "New Air"	Annual Cost to Condition ¹ w/105 CFM CVR	Savings
0.8	330	\$702	\$226	\$476
0.6	280	\$604	\$226	\$378
0.4	225	\$488	\$226	\$262
0.2	155	\$338	\$226	\$112
0.1	105	\$226	\$226	--

1 Cost figures from Paul Raymer, "Cost of Ventilation" Ventilation News and Views Aug 2013 for Boston: HDD(55) = 3299, Gas = \$1.28/therm Electricity = \$0.18/kWh

The Flow Rate table compares the airflow through a six inch (6") duct at various pressure conditions. **Example: If code requires 100 CFM of fresh air but increased pressure actually pulls 225 CFM instead, you have thrown away roughly \$262 annually.**