PRINCIPLES OF OPERATION

Mode HVI Energy Miser Jet Induction terminals combine the benefits of both single duct VAV cooling and induction to maintain room air motion and efficient space temperature control. The primary conditioned supply air flow rate is controlled by pressure independent pneumatic, electronic analog, or DDC controls, see pages G-17, 18. In response to the space thermostat demand, the controls operate a high efficiency variable nozzle.

The high velocity jet controlled by the nozzle creates a negative pressure within the unit casing. As the primary air flow modulates from maximum to minimum flow, the secondary induction damper simultaneously opens, allowing increased induction air. Pages G-17, 18 show typical sequences of operation. Optional Electric or Hot Water heating coils may be added for perimeter zones requiring heat.

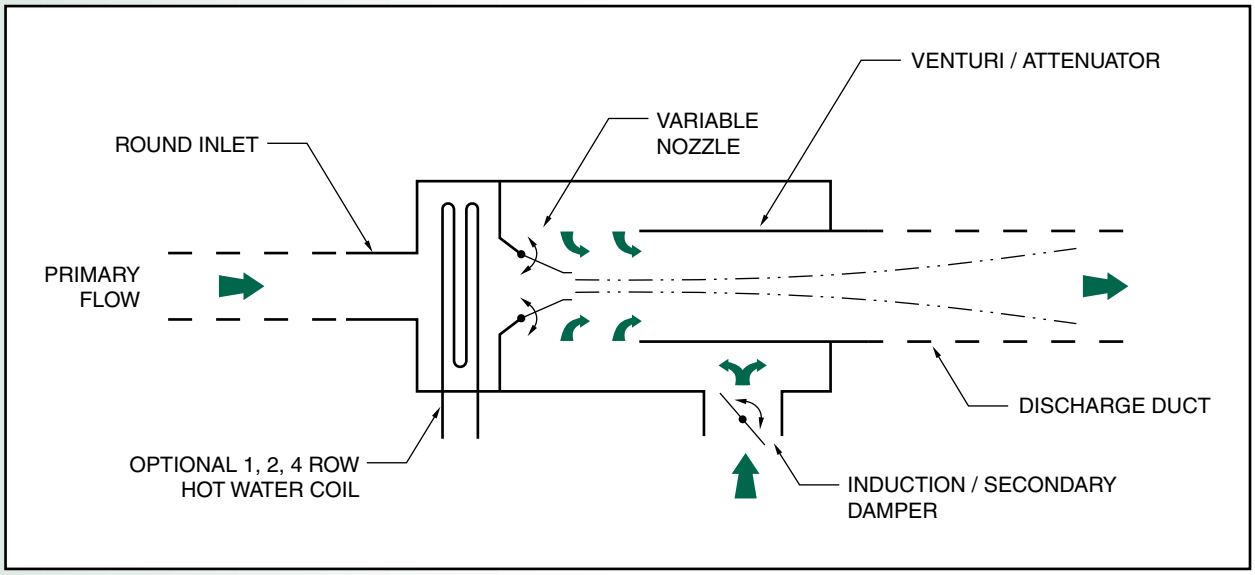


Figure 15: Concept

INDUCTION CHARACTERISTICS

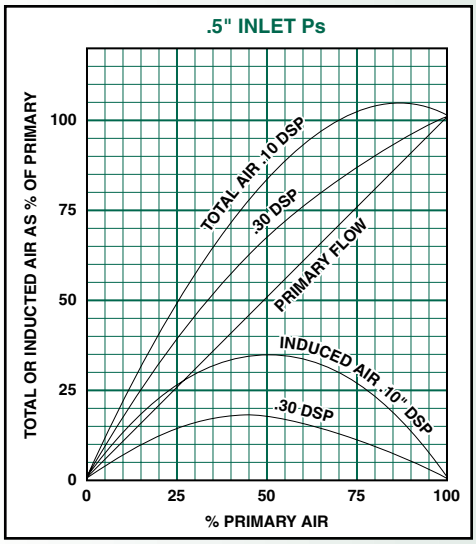
The primary air flow is regulated by the flow controls, and is reset by varying the primary nozzle opening. The induced air capacity varies directly as the inlet static pressure increases, and inversely as the downstream pressure increases.

The induction characteristic curves shown illustrate the percent of Total Air and Induced Air for the full range of primary flow rates.

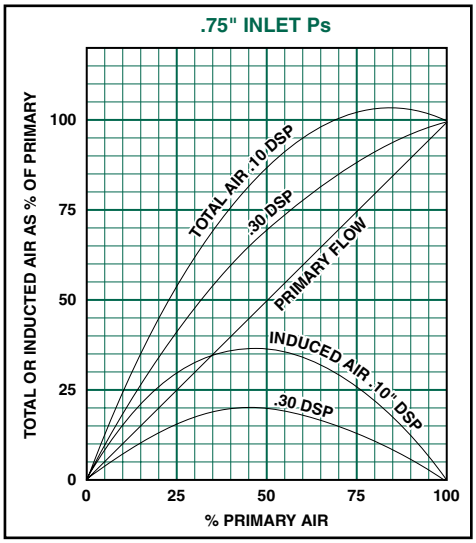
The values of Total and Induced Air are given as percentages. Values may be interpolated at other inlet and downstream pressures. Inlet pressures shown are without hot water coils. The pressure requirement of the coil at maximum primary flow must be added to the inlet static pressure shown for the given induction curve.

HOW TO READ INDUCTION CHARTS

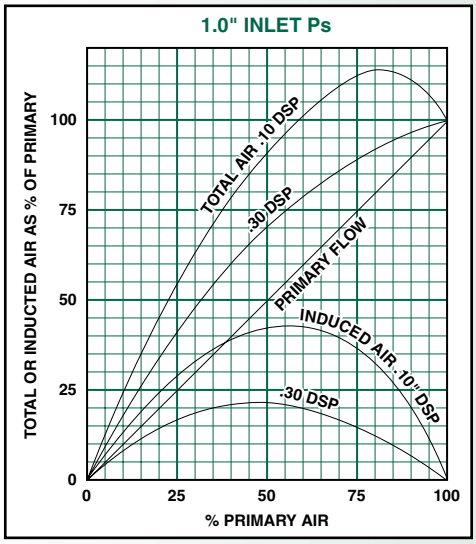
Example: Determine the induced and total air capacity of an 8" HVI terminal when the primary flow is at 50% of the maximum design flow of 800 CFM at .5" inlet static pressure and .10" downstream static pressure (DSP). The downstream pressure includes the resistance of the downstream duct work, diffusers, plus the pressure drop of the return air through the ceiling opening. Referencing Graph 14.1 for the HVI at .5" inlet static pressure, at 50% primary flow rate, find the total and Induced Air percentages on the .10" Downstream Ps Curve. The Total Air delivered is 83% of maximum flow (800 CFM) or 800 x .83 = 655 CFM. The Induced air is 33% of maximum flow or 265 CFM. Total Flow = Induced Flow + Primary Flow = 265 CFM + 400 CFM = 665 CFM.



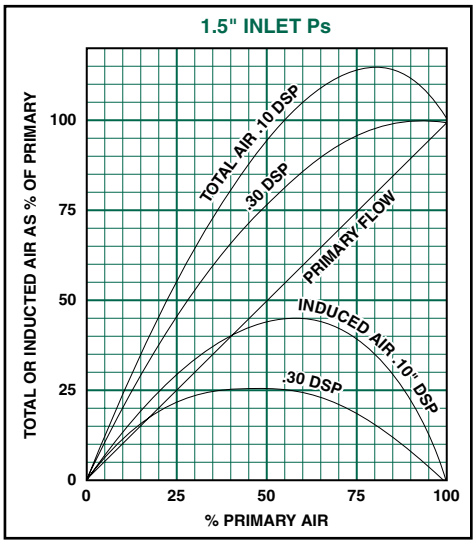
Graph 14.1



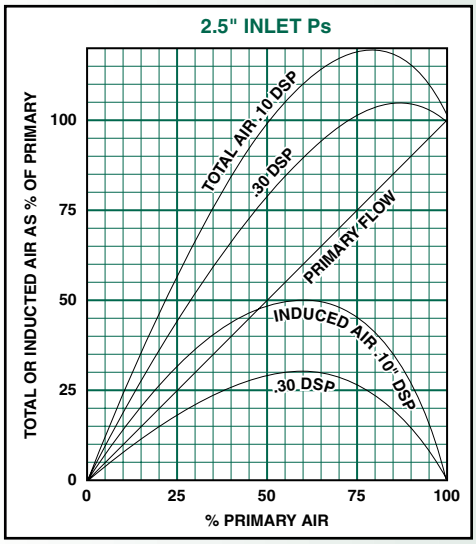
Graph 14.2



Graph 14.3



Graph 14.4



Graph 14.5