



# IMPROVING AIR INDUCTION SYSTEM PERFORMANCE TO AVOID THE CARBON FOOTPRINT FINE

New INDUCTION AIR VALVE™ control valve converts constant air volume to VAV inside existing perimeter induction units

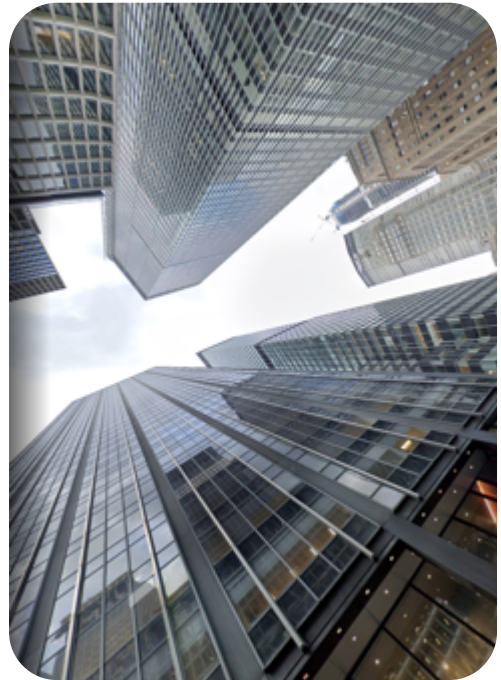
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*New York City has more than 300 commercial buildings that use perimeter induction systems for heating and cooling. These constant volume air systems, which have not been substantially updated for a half century, are typically the highest energy users of BTUs per square foot. Operating 3,000 hours a year, these units provide more than 50% of total cooling and ventilation and 90% of heating (which costs three times more than cooling).*

*As if energy inefficiency, high costs and problematic zoning weren't enough, building owners now face an impending carbon footprint fine that can add hundreds of thousands of dollars of additional cost.*



## CONVERT YOUR CONSTANT VOLUME AIR INDUCTION SYSTEM TO VAV

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There is a solution. Advanced Concept Energy Solutions™ (ACES) new **Induction Air Valve™** (IAV) control valves quietly convert constant volume perimeter air systems to variable air volume. Using VAV reduces fan horsepower and the amount of outside air needed for heating and cooling.

It wasn't long after ACES principals John Griffin and Jon Darcy finished a partial replacement of 1,600 induction units for the Seagram Building at 375 Park Avenue that the pair perfected the IAV valve.

"The Seagram project proved that replacing aging constant air perimeter induction units with modern units did draw less outside air, improve air circulation and significantly cut energy usage, in this case saving \$960,000 in energy costs the first year," said Griffin. "But replacement is expensive, and in some cases prohibitive. This was the problem we set out to solve."

## REVOLUTIONARY DESIGN CUTS INSTALLATION COSTS

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Griffin and Darcy, who have several patents between them and are recognized leaders in the industry, designed an IAV control valve that converts constant air perimeter induction units into variable air volume units.

## Converts constant air to VAV inside existing units

The IAV valve's uniqueness lies in its 7" design that fits securely inside existing induction unit inlets – providing for an unprecedented ease of installation. Each valve receives and acts on information transmitted from thermostats, including local temperature, set point, percent of valve closure, and more.

Using this information, each IAV responds using dampers with multiple edge points that break up the full air stream into mini air streams, regulating air flow based on space requirements (VAV mode). Less air volume reduces fan horsepower, and a sound-absorbing core material substantially reduces noise from the induction unit.

ACES offers two IAV valve models to quickly and economically convert any building to VAV regardless of perimeter induction unit age. The pneumatic IAV valve connects to older existing thermostats and the electronic IAV valve connects to both new and some later model thermostats.

Installation is quick and non-disruptive to daily business. Each valve can be installed in about 10 minutes.

"Tenants appreciate that IAVs keep the temperature constant to one-tenth of one degree. They even lower perceived HVAC noise to a nearly inaudible level," Darcy said



*Pneumatic IAV™ Valve*



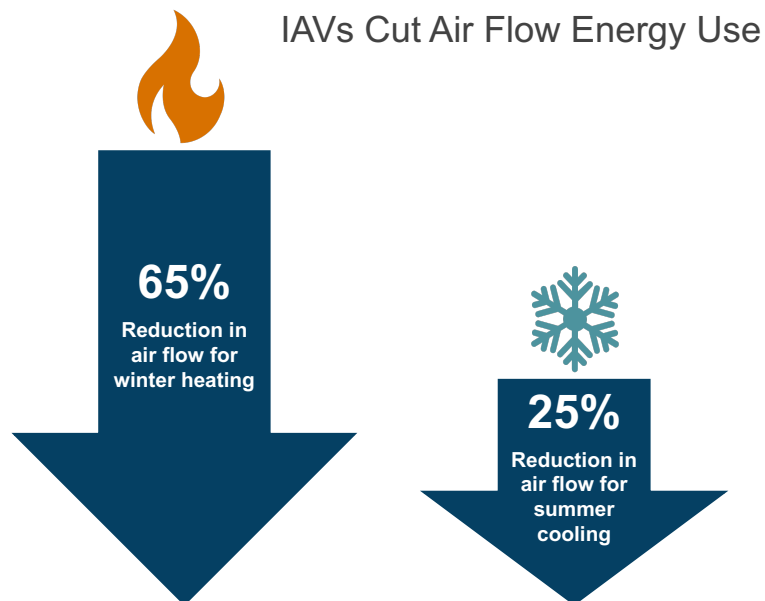
*Electronic IAV™ Valve*

*Each 7" valve  
takes just 10 minutes  
to securely install  
in an existing perimeter  
induction unit inlet.*



## Proof is in the numbers

In testing IAV valve usage at six prominent buildings in New York City, ACES confirmed reductions of air flow averaging 65% in winter and 25% in summer.



"With IAV valves regulating air flow, the largest office building in New York operating a 370 HP perimeter fan for 3,000 hours per year can achieve the same heating and cooling performance with a much smaller 70 HP perimeter fan," noted Griffin. "That's a 67% cut in kilowatt hours and an annual savings over \$600,000 with the rebate in just the first year."

Another way IAV valves save money is that they can be programmed to provide after-hour heating and air conditioning on a office-by-office basis. For businesses requiring after-hours access, like law and accounting firms, this capability lets operators heat or cool only spaces being used.

## CARBON EMISSIONS TRANSPARENCY

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### Posting building Energy Star Score now required

Beginning in 2020, Local Law 95 requires all buildings in New York City over 25,000 square feet to prominently post their Energy Star Score letter grade on the front door. The first letter grades will be based on the 2019 calendar year Energy Star. Scores will be updated annually. Buildings that are not eligible for a score will receive an "N" and may

Energy Grade	Energy Star Score
<b>A</b>	85-100
<b>B</b>	70-84
<b>C</b>	55-69
<b>D</b>	1-54
<b>F</b>	Non-Compliant
<b>N</b>	No ES Score or Exempt



be required to post the building Energy Use Intensity (EUI).

A low score or being non-compliant could debilitate leasing programs since many tenants value green buildings.




## Costly carbon footprint fines coming with Local Law 97

Big fines are coming for buildings out of compliance with Local Law 97 carbon emission standards. According to a leading engineering firm, a 1 million square foot office building that exceeds the hard cap on carbon emissions by only 10% could receive a fine of \$230,000 per year, starting in 2024. Left ignored, this fine will jump to \$1.2 million per year beginning in 2030.

## THE SAVINGS ADD UP

Installing IAV valves makes fiscal sense for buildings operating constant volume perimeter induction systems. The outlay investment for the biggest buildings is quickly repaid in less than three years, and for some in little over one year.

### Typical Costs and Payback 1.3M Sq. Ft. Building Requiring 1,000 IAVs and 350 Digital Controllers

 Costs		 Annual Out of-Pocket Savings		 Payback	
Costs for equipment and installation	\$790,000	808,669 kWh savings@\$.22	\$177,907	<b>\$541,603</b> annual energy savings.	
ConEdison HVAC energy efficiency rebate	-\$242,601	Winter steam savings	\$341,491	<b>1.01 years</b> to recoup installation investment.	
		Summer cooling savings	\$22,205	<b>\$161,575</b> annual savings for compliance with Local Law 97 carbon emissions, beginning in 2024. Over five years, this carbon fine avoidance adds up to <b>\$807,875</b> .	
Actual installation cost less rebate	\$547,399*	Annual Energy Savings	\$541,603		
*Energy saving capital improvement costs can be passed on to tenants.					



The standard New York operating cost escalation clause permits owners to pass on the cost of capital improvements intended to save energy, like IAVs. The cost can be passed on to tenants possibly with a 5% interest factor, provided the cost is amortized over the expected savings period.

## INCREASE TENANT APPEAL

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New York City tenants are increasingly looking for, if not demanding healthy building spaces for their employees and clients. Leasing professionals know that posting LEED certification and compliance with carbon emissions ahead of Local Law 97 are attractive sales incentives.

Currently seven buildings in New York City are installing IAV valves:

- 733 Third Avenue, The Durst Organization
- 1185 Avenue of the Americas, SL Green
- 437 Madison Avenue, Sage Realty
- 650 Fifth Avenue, Cushman & Wakefield
- 55 Water Street, New Water Street Corporation
- 888 Seventh Avenue, Vornado Realty Trust
- 299 Park Avenue, Fisher Brothers

Many more have performed NYSERDA studies for rebates and are budgeting installations in their future capital budgets.

"It makes sense to act now," said Tim Clancy of Cushman & Wakefield, who recently installed IAV valves at 650 Fifth Avenue. "In no time at all, we're using less energy, we've cut operating costs, improved tenant comfort and are shrinking our carbon footprint."

He added, "IAVs make our old system new again and dramatically improve the building's energy profile, a positive for everyone."

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Tim Clancy  
Cushman & Wakefield