



Constant Airflow Regulators

CAR-II

by **AMERICAN**
aldes
VENTILATION CORPORATION

THE SIMPLE SOLUTION

The model **CAR-II Constant Airflow Regulator** is a modulating orifice that automatically regulates airflows in duct systems to precise constant levels. The passive control element responds to duct pressure, and requires no electric or pneumatic sensors or controls.

The CAR-II compensates for changes in duct pressure caused by thermal stack effect, duct length, wind pressure, building pressure, dust clogging of filters, etc. The CAR-II also provides a low cost solution to balancing forced air systems for heating, air conditioning and ventilation, eliminating the need for on-site damper adjustment. The CAR-II will regulate airflow in supply, return or exhaust duct systems.

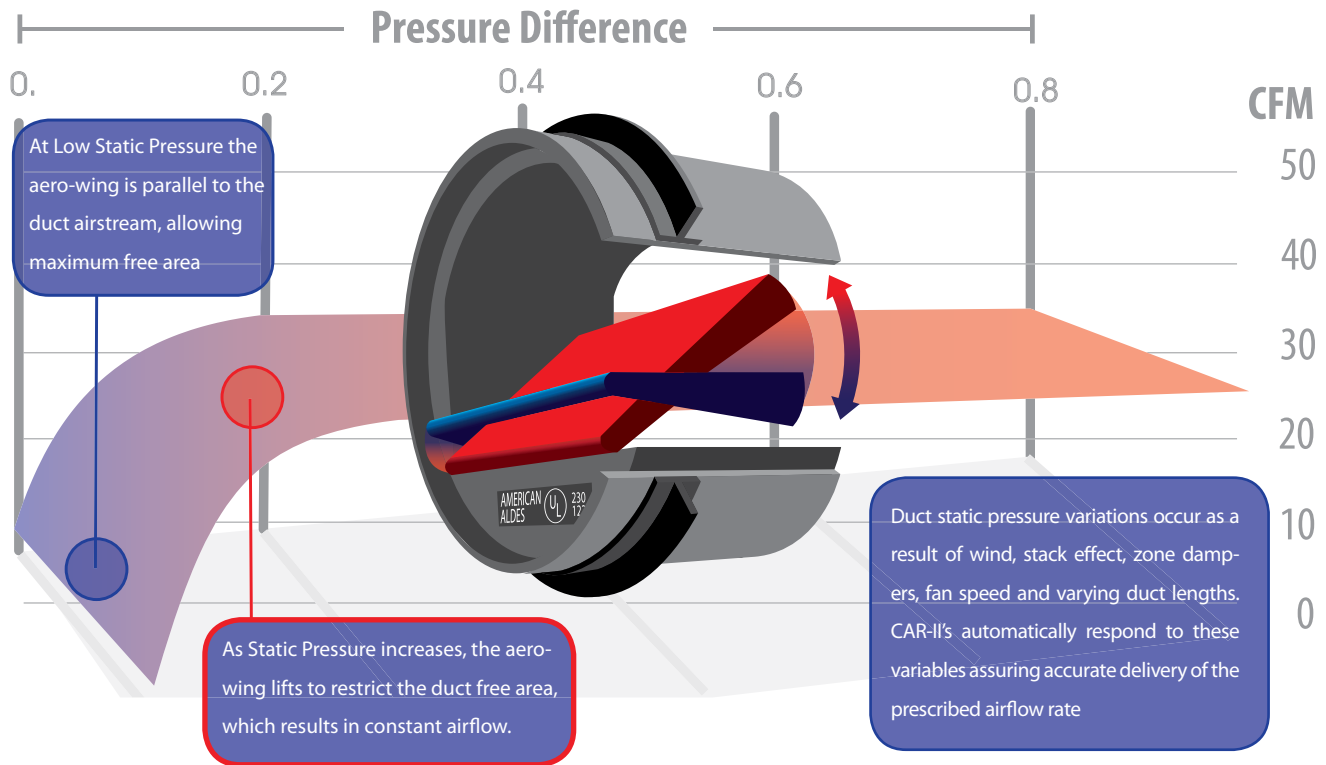
The active control element of the CAR-II is a unique aerowing. Using the Bernoulli effect, the active control element of the CAR-II lifts in response to increasing static pressure in the same way the wing of an airplane provides lift as faster air moves over it. This operation regulates the free-area opening through the control, resulting in maintenance of the factory calibrated airflow set points. Each CAR-II is designed and produced for control of air in temperatures ranging from -25° to 140° F (-32° to 60° C.)

The round CAR-II is constructed of a self-extinguishing UL94V-0 ABS polymer, and is UL 2043 safety listed and labeled for flame and smoke generation. The assembly is sized to fit inside standard rigid round ducting, as well as fittings such as takeoffs, tees, etc. A lip or flex-type ring seal gasket around the circumference ensures a tight, no-leak fit.

The CAR-II airflow regulators control airflow to within 10% of rated flow (15% for units 50 cfm or less) accurately throughout the target operating pressure range of 0.2 to 0.8 in. w.g. (50 to 200 Pa). High pressure units are available with an optimum operating range of 0.6 to 2.4 in. w.g. (150-600 Pa). Each CAR-II is factory tested and calibrated to the rated set point before shipping. On-site field adjustment of airflow set points can be made on most models. Each diameter of CAR-II regulator is available in multiple factory calibrated set points.



HOW THE CAR-II WORKS



MAINTENANCE

The CAR-II needs no maintenance when used in normal conditions. There is no risk of dust deposit or obstruction because the CAR-II has no airways subject to clogging. If the intended application includes air heavily loaded with grease or dust, a fitting with an access panel or door (such as that used for flame dampers) should be provided.

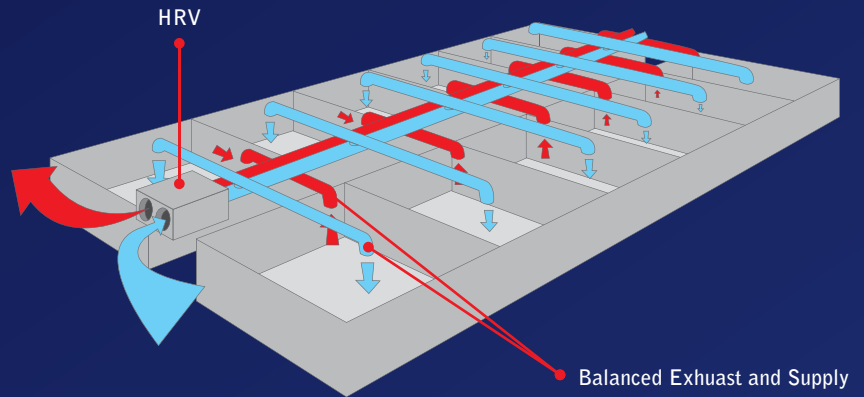
WARRANTY

Guaranteed for 5 years from date of shipment, against all defects in material or workmanship provided that the material has been installed and utilized under normal conditions. This warranty is limited to the repair or replacement of the material.

APPLICATIONS

AUTOMATIC AIRFLOW BALANCING

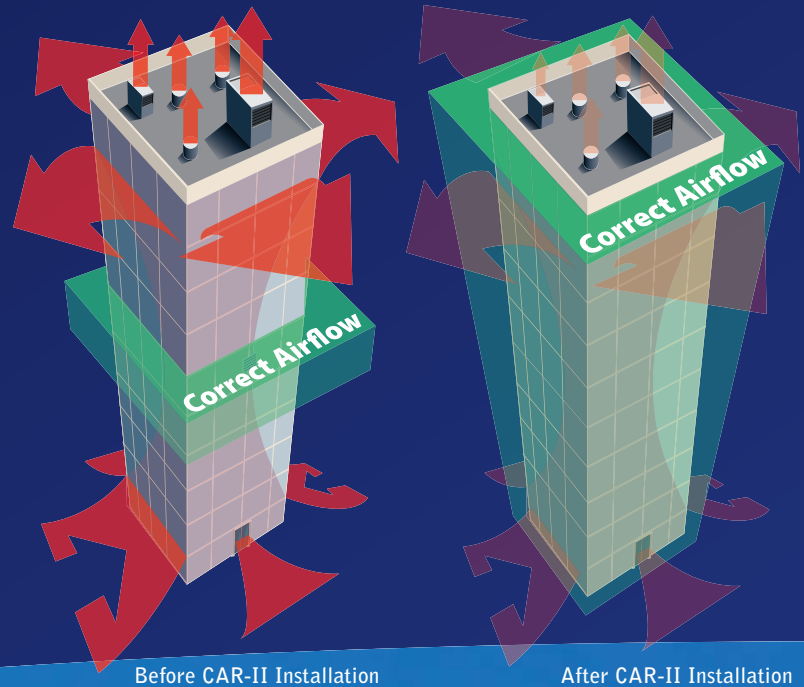
Supply and return/exhaust airflow for each area is automatically balanced by installing the CAR-II in the branch ducts or terminal device locations. CAR-II's are commonly used in heat and energy recovery systems to ensure maximum efficiency.



CORRECTING STACK EFFECT

When outside air temperatures are cold, warm indoor air expands and rises like a chimney. This results in pressure variation to vertically ducted central ventilation systems, causing over-ventilation at some levels that wastes energy, and under-ventilation at other levels that prevents proper contaminant removal. These pressure imbalances can also cause cross-contamination or force unwanted air from one compartment to the next. Cross-contamination is often the cause of many poor indoor air quality problems.

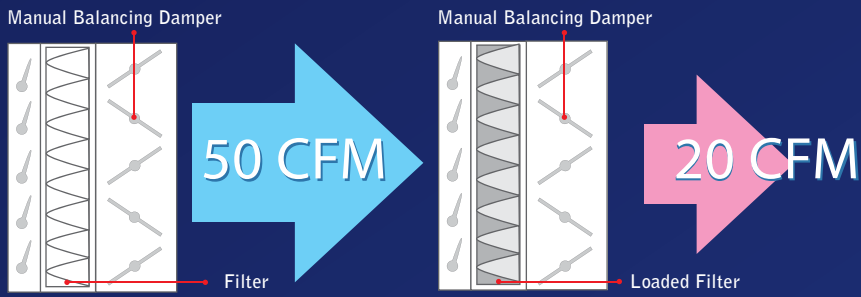
Installing a CAR-II at each grille or diffuser location eliminates stack effect on the ventilation system.



INDOOR AIR QUALITY

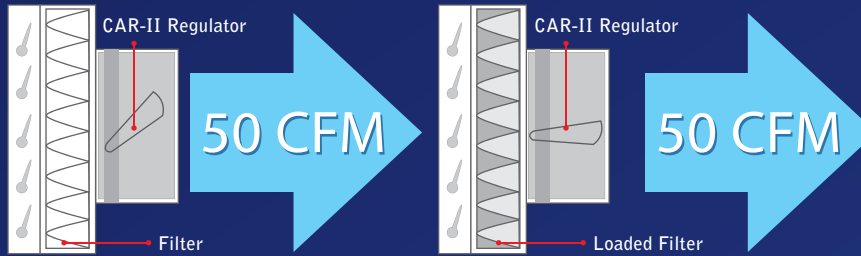
Building codes and standards for energy efficient building practices have specific requirements for outside airflow control and exhaust ventilation. The CAR-II is the easiest way to ensure precise airflow control and code compliance without expensive and time consuming field adjustment and measurement.





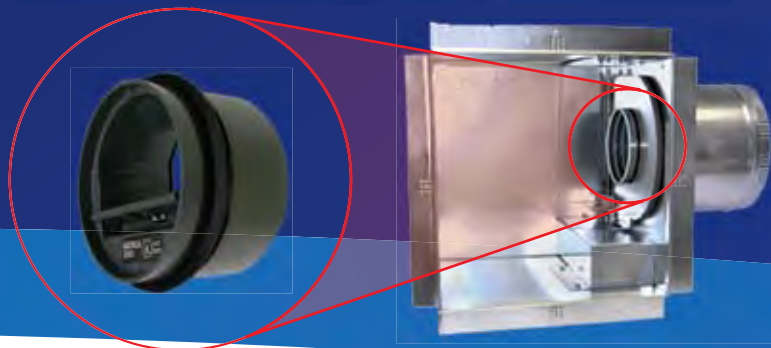
AUTOMATIC CORRECTION

Installation challenges and user interaction can result in “field” modifications to intended system designs. CAR-II’s will automatically adjust to compensate for changes in duct length, duct leakage, proper filter selection, filter loading, and damper settings, to always deliver the proper designed airflow rate.



FAN CONTROL

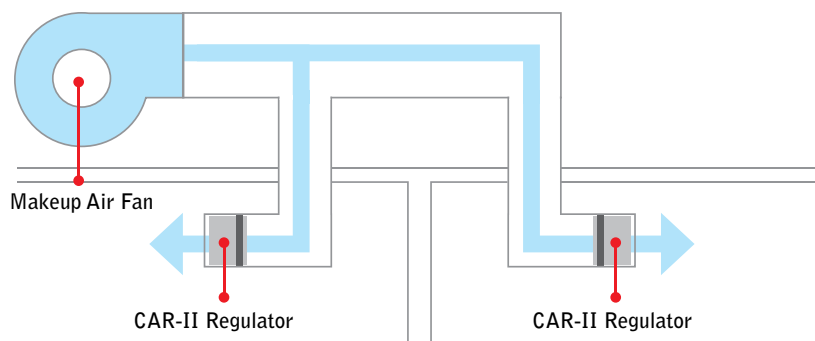
CAR-II’s are used in a variety of different exhaust, supply, and blending fans to match fan airflow to specific applications. This eliminates the need for separate speed controls or manual adjustment. All of the ALDES Ventergy® Series fans include CAR-II devices for precise airflow control and delivery.



ZONING

Motorized dampered zoning systems have wide variations in airflow delivery rates and duct pressure. The pressure-independent CAR-II keeps airflow rates constant on demand.

Airflow Controlled by CAR-II



OUTSIDE AIR CONTROL

CAR-II’s are used to control the amount of outside air brought into a building when installed in; makeup airfan systems and AHU outside air plenums. This guarantees a delivered airflow rate and prevents over-ventilation in windy conditions.

CASE STUDY

In October 2008, the NAHB Research Center published a case study that showed conclusively how installing ALDES Constant Airflow Regulators improves air flow balance in multi-story buildings with central exhaust ventilation systems. This improvement provides many benefits, among them: “consistent airflow to... lower stories”, “[preventing] overventilation to upper units”, “without seasonal maintenance or electrical supply to the CAR regulator” Most importantly, the study finds that the CAR-II provides “ considerable operating cost savings,” and “over 27% energy savings.”

“over 27% energy savings”

Airflow data for each floor from Partnership for Advancing Technology in Housing’s Final Report on the Evaluation of Constant Airflow Regulators (CAR) in Multi-Family, Multi-Story Central Ventilation Systems, (October 2008). Provided by the NAHB Research Center

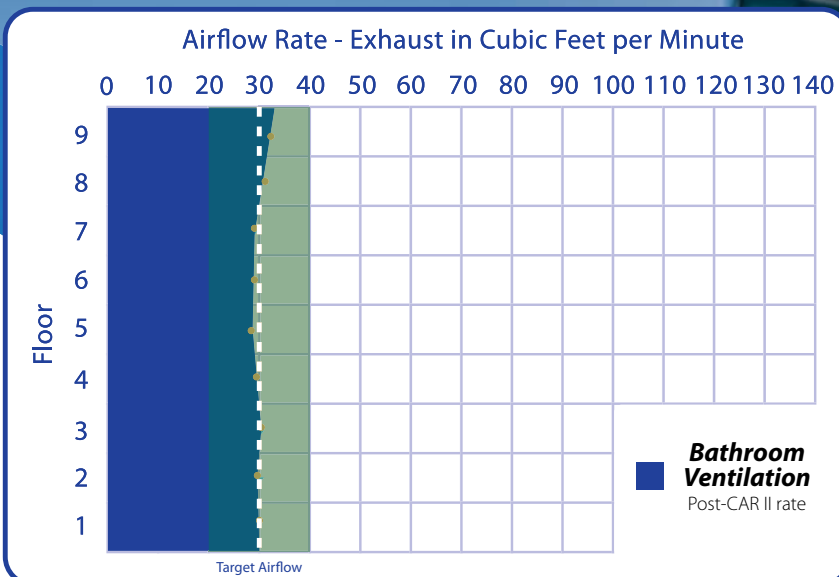
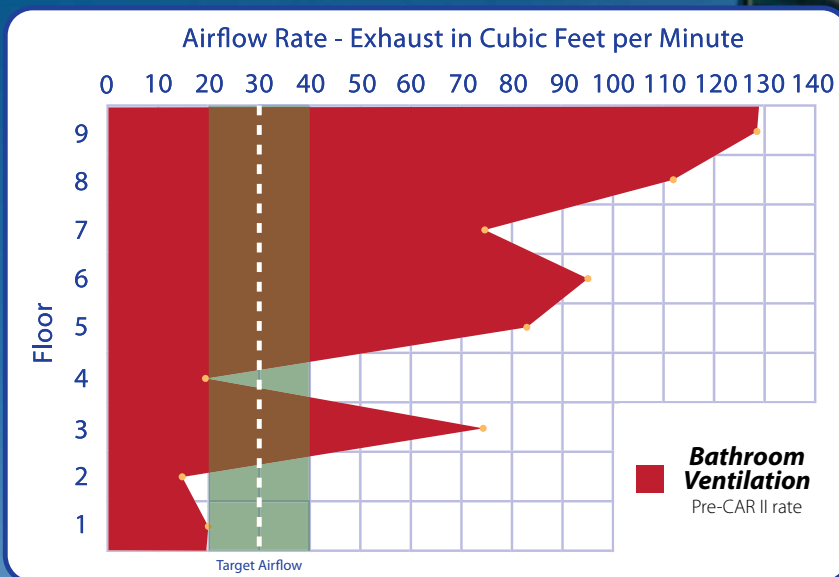
BEFORE

Bathrooms in the building were over-ventilated by ~150% in over 60% of all apartments. This represents a serious waste of energy in addition to inflated operation costs.

Bathrooms were underventilated in just over 30% of all apartments., posing a serious IAQ issue.

AFTER

When the NAHB Research Center visited the site to follow up, they calculated that the installation of ALDES CAR-II’s generated an energy savings of nearly 30%



CONFIGURATIONS*

*custom configurations are always available, contact your sales representative about your unique needs.

	supply air	exhaust air	round duct	square duct	retrofit option	new construction	with grille	w/o grille	with fire damper	w/o fire damper
 CAR-II Constant Airflow Regulator	■	■	■		■	■		■		■
 CAR-S-II Constant Airflow Regulator Square	■	■		■	■	■		■		■
 CAR-FEA-II Constant Exhaust Regulator w/FD		■		■	■	■		■	■	■
 CAR-FSA-II Constant Supply Regulator w/FD	■		■	■	■	■		■	■	■
 CER-S-II Constant Exhaust Register		■		■	■	■	■			■
 CER-R-II Constant Exhaust Register		■	■		■	■	■			■
 CSR-S-II Constant Supply Register	■			■	■	■	■			■
 CSR-R-II Constant Supply Register	■		■		■	■	■			■
 CER-FEA-II Constant Exhaust Register w/FD		■		■	■	■	■		■	
 CSR-FSA-II Constant Supply Register w/FD	■		■	■	■	■	■		■	
 CERB-II Constant Exhaust Register Box		■	■	■	■	■		■	■	■
 CSR-B-II Constant Supply Register Box	■		■	■	■	■		■	■	■



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