# **Multi-Family Ventilation**

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AHREKPO INNOVATION AWARDS 2020 FINALIST

Solutions for buildings with multiple living spaces

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# Unique challenges to ventilating multi-family dwellings

At American Aldes, we understand the challenges engineers face when designing multi-family dwellings. You have a myriad of elements to consider. We live and breathe these challenges every day and have designed solutions to satisfy all of those involved from planners, installers, inspectors, and building owners to residents and building managers.

### **Shared Walls**

What we think of as a multi-family building, is home to the people who will walk through the door at the end of the day. It's where families gather for meals, it's where kids play, it's where memories are made. Residents may not notice when indoor air quality is healthy, but they certainly will if it's not. Shared walls, floors, and ceilings make proper ventilation especially critical in preventing unpleasant next-door odors from seeping into adjacent spaces.

### **Air Balancing**

Air balancing can be complex. Centralized ventilation means there's just one unit to maintain, but balancing airflow can be challenging, and airflow needs fluctuate constantly. Some dwellings may be occupied and full of activity while others are empty for weeks or months at a time. Activity in shared spaces—fitness rooms, lounge areas, laundry centers—may fluctuate throughout the day.

### **Energy Efficiency and Costs**

The intent for some multi-family buildings is for residents to own their own space, while in others, the intent is for occupants to rent, whether long term or short term. Both instances come with decisions to be made about how energy will be metered and billed. All occupants can share the costs associated with one central unit, or each can be responsible for the cost to run their own unit. There are benefits of each method and what's right for one condominium may not be the right solution for the next.

### **Limited Space**

Space is at a premium, and every inch devoted to equipment is an inch that's not counted as living space. We've worked through the challenges of limited space for ducts and equipment and the need to ensure that ventilation equipment is compact yet powerful.

### **Building Envelope Penetration**

We understand the importance of each building's curb appeal. In some cases, clean lines along outside walls are important, with as few duct penetrations as possible. Other buildings are designed with features, such as balconies or columns, that make duct penetrations naturally less noticeable. Our research and development engineers have taken this into consideration when designing ventilation solutions.

### Maintenance

We understand that there are maintenance issues to be considered. Do the units need to be easy to access? Via the rooftop? A mechanical room? In the ceiling of each dwelling? How frequently will they need maintenance? Will maintenance generally be done by a professional or are occupants expected to maintain the units? All of these are factors to consider.

Don't worry, whatever your ventilation needs, we've got you covered.









# American Aldes Experience and Expertise

For over 35 years American Aldes has been providing ventilation solutions for residential, commercial, and multi-family buildings. Our multi-family ventilation products in particular have been installed in thousands of apartment buildings, senior living facilities, dormitories, military barracks, and condominiums across the nation and continue to be a key driver of our business.

We do more than provide systems for new construction; we work with engineers on renovation projects, providing custom retrofit solutions tailored to each project's unique situation. We're a member of the US Green Building Council, the Home Ventilating Institute and are an ENERGY STAR<sup>®</sup> partner.

American Aldes takes a proactive approach to multi-family ventilation. By working with American Aldes, building designers can prevent the detriments of stack effect, minimize envelope vent penetrations, and balance exhaust ventilation systems. American Aldes products can be used for centralized or compartmentalized solutions in high-rise or low-rise buildings.

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# Multi-Family Codes and Regulations

At American Aldes, we've worked with engineers to provide solutions for senior living facilities, college dorms, apartments, condos, military barracks and more. At Aldes, we understand the difficulty of complying with many levels of codes regulations and we work with engineers to ensure all requirements are met.

Multi-family dwellings have tailored regulations because of the challenges related to variable occupancy rates. We've been involved in ASHRAE since our inception and have kept at the forefront of updates and changes. Energy efficiency can be difficult to achieve in multi-family dwellings, and we've met these challenges with determination, working with LEED and becoming an ENERGY STAR® partner, providing a lineup of products that will help you achieve energy efficiency and code compliance.

# **Resources at your Fingertips**



American Aldes understands the challenges engineers and contractors face in providing ventilation that meets code requirements. Our experts are on hand to answer your questions and help you select the right products for the job.



We're committed to providing you with the tools and information you need. From brochures, spec sheets and Revit-compatible BIM models to installation manuals and warranties, we stand behind our products from specification to installation and beyond.

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All of our product literature and downloads are available on our website at **www.aldes.us**. For even easier access to multi-family products in particular, visit the electronic version of this application guide, where all the products listed are linked directly to the product information pages on our website.



If you're looking for specific examples of similar projects that use American Aldes products, check out our Featured Projects Map on our website. It's a clickable map that you can filter by state, product, sales representative, or project type. Simply select "Multi-Family" under the product category filter to see a sampling of recent projects across the nation.

# Centralized vs. Unitized Solutions

Apartments. Condos. Dorms. Senior Living. Military Barracks.

All of these have compartmentalized living spaces within a larger building. Ventilation can either be centralized with all airflow controlled by one large unit, or unitized so the airflow can be controlled separately in each individual living space.

# **Centralized Systems**

Centralized systems come with their own set of challenges. If not designed correctly, these rooftop systems will have poor overall performance. Some portions of the building can be easily over-ventilated, which uses more energy than necessary, while at the same time other portions of the building can be under-ventilated, causing poor indoor air quality. Balancing these systems can be difficult and costly. American Aldes has solutions.

## Constant Airflow Regulators (CAR-II)

CARs correct stack effect. Tall building ventilation systems become severely out of balance due to fluctuation in environmental conditions. Too much air is drawn from some floors, while other floors don't receive enough ventilation. Stack effect can also cause cross-contamination where stale air is drawn from one floor and forced back into another. Aldes Constant Airflow Regulators (CAR-II) can correct stack effect by automatically adjusting to the changes in static pressure so that energy is not wasted and optimum indoor air quality is maintained.







Before CAR-II installation.

After CAR-II installation.



# Constant Exhaust Registers (CER) and Constant Supply Registers (CSR)

combine the above-mentioned Constant Airflow Regulators with an exhaust or supply grille constructed of heavy-gauge extruded aluminum to prevent rust in moist environments. The regulating element (CAR-II) is integral to the grille, and is secured in an air-tight mounting plate. The entire assembly is designed to be attached directly to the duct (available for square or round duct). See illustration on p. 7.

# Constant Exhaust & Supply Registers with Fire Damper (CER-FEA-II or CSR-FEA-II)

CER-FEA-II or CSR-FEA-II combine the Constant Airflow Regulator with a grille, steel sleeve and fire damper. The fire damper is tested and listed per UL555 for use in a wall or shaft application and is rated for two-hour protection. Three-hour fire dampers can also be used. Each sleeve is welded to provide durability. The assembly is sized to fit inside standard duct riser openings and chases.



## Zone Register Terminals (ZRT®) available in exhaust or supply models

ZRTs regulate ventilation without the need for individual fans. Each ZRT is a combination grille, register box, control damper, and optional flow regulator(s). This unique combination provides up to four different control schemes without the need for expensive pneumatic, electronic, or DDC control systems.









# Centralized Systems cont'd

#### Parallel Damper In-Line Zone Register Terminals (ZRT-PDIL)

ZRT-PDILs are designed to introduce flexibility and dynamic control to central supply or exhaust ventilation systems. Used in both large and small systems, the ZRT-PDIL regulates ventilation without the need for individual fans or traditional variable air volume terminal units.

Each ZRT-PDIL is a two-position pressure-independent terminal with a control damper to regulate high limit on-demand airflow control and integral passive regulators for automatic air balancing of the minimum and maximum setpoints. This unique combination provides flexible control schemes without the need for expensive pneumatic, electronic, or direct digital control systems.

The ZRT-PDIL is primarily used for combination low-flow indoor air quality ventilation or make-up air—such as in unoccupied apartments—and on-demand high-flow spot ventilation—such as occupied apartment or even bathroom exhaust fans—using the same central exhaust or supply fan system.









HRVs and ERVs maximize energy efficiency. Bringing in fresh air and then heating or cooling that air to make it comfortable for occupants can be costly. Our commercial line of HRV/ ERVs reduce the costs of heating ventilated air in the winter by transferring heat from the warm inside air being exhausted to the fresh (but cold) supply air. In the summer, the inside air cools the warmer supply air to reduce ventilation cooling costs. Aldes wide range of commercial HRV/ERV solutions makes it easy to align the scope of your project with the perfect unit.



### Constant Exhaust Grille (CEG-II)

CEGs combines an airflow control element that automatically regulates airflow in exhaust dust systems to constant levels. It responds to duct pressure and requires no electric or pneumatic sensors or controls. The CEG-II compensates for changes in duct pressure caused by thermal stack effect, building pressure, dust clogged filters, etc. Similar to the CAR-II, it provides a low-cost solution to balancing airflows in multiple-point exhaust systems by eliminating the need for on-site damper adjustment. The airflow element is housed in a decorative white molded cover suitable for almost any architectural or design style. The unit can be adjusted to distinct pre-calibrated airflow settings, making it easy for a contractor or end-user to make on-site adjustments if ventilation demand changes.





#### Occupancy-Sensing Grille (OSG)

OSGs are stand-alone terminals that automatically boosts the exhaust airflow when a room is occupied. A lens detects movement and triggers circuit opening (instantaneous) and closing (after a 20-minute time out). The OSG is designed for spaces that are not occupied continuously. It is ideally suited for bathrooms, laundry rooms, and kitchen areas.



# **Unitized Systems**

Unitized systems, also called compartmentalized systems, have the distinct advantage of giving occupants control over their own indoor air quality, energy usage, and metering. If maintenance is ever needed, only one living space is impacted. From compact sized heat and energy recovery ventilators to single and multi-port fans to airlets, Aldes has a solution for virtually any size multi-family dwelling.

# InspirAIR<sup>®</sup> Compact Heat and Energy Recovery Ventilators (HRV/ERV)

InspirAIR<sup>®</sup> Compact Heat or Energy Recovery units maximize energy efficiency. American Aldes multi-family line of HRV/ERV—InspirAIR<sup>™</sup> Compact—are sized just right for smaller living spaces like condos, apartments, or dorms, and, deliver between 80 and 130 CFM of fresh, filtered air for all occupants to enjoy. Our E80-HRG unit includes the first in-suite air exchanger to offer an automatic free cooling economizer function feature that saves energy by using cool outdoor air to help reduce the demand for air conditioning during spring and fall. The slim height of just 9" easily fits above suspended ceilings.





#### IQ by Aldes Vertical Fan Coil unit with Integrated HRV or ERV

Discover Aldes' unique vertical stacked fan coil with integrated heat or energy recovery. Use in individual condos, apartments, barracks or senior living for lower initial cost compared to central systems. This unit provides better occupant control, meets demand-control ventilation requirements, and saves space by combining heating and mechanical ventilation in one compact unit. Integrated HRV or ERV fan coils meet or exceed the industry standards for performance, sound and quality. With 6 unit capacities for efficient control, automatic coil freeze protection, 2-way or 3-way valve operation, efficient EC motors for lower electricity costs and automatic fresh air balancing, it is one of the most cost-effective and versatile in-suite units available.

### Ventergy® Series Fans

Ventergy Series Fans <sup>®</sup>deliver performance, efficiency and flexibility. American Aldes range of ENERGY STAR<sup>®</sup> rated ventilators, are smart choices for individual apartments and condos. Small enough to fit in tight spaces, these versatile fans can be used for whole house IAQ or for spot ventilation in bathrooms, laundry rooms and kitchens. Ventergy<sup>®</sup> fans are available as in-line exhaust, multi-port exhaust, distributing supply, filtering supply, and blending-filtering supply. These ventilators are designed for low-rise buildings and residential applications only.



#### AIRLETS™

Airlets<sup>™</sup> introduce controlled amounts of fresh air through a wall without the use of a duct system. American Aldes has the most borad range of window- and wall-mounted fresh air inlet devices on the market. AIRLETS<sup>™</sup> are designed compliment exhaust systems by introducing controlled amounts of fresh air and are easily adjustable for walls of varying thickness. Airlets<sup>™</sup> are designed to be used in low-rise buildings and are not for use with forced air heating and cooling systems.





# Off-the-Shelf and Customized Solutions

American Aldes has been providing off-the-shelf solutions for over 30 years, so you can depend on our full lineup of products, and guidance when you need it. As buildings age, updates are needed and off-the-shelf solutions may not always work with older, existing systems. That's where we work with you to customize products and ensure they'll fit the space and function exactly as you expect. Over the past 30 years we've worked on hundreds of customized retrofit projects and we're pleased to offer this as an ongoing service to our customers.



# Multi-Family Products Quick-Reference Chart

Whether the building is low-rise or high-rise, and uses central or unitized systems, American Aldes has a variety of solutions.

= Commonly used

= Sometimes used

	ACCESSORY		LOW-RISE (3 stories or less)	HIGH-RISE (4 stories or more)
Centralized Solutions		Constant Airflow Regulators (CAR-II)		
		Constant Exhaust Registers/ Constant Supply Registers (CER & CSR)		
		Constant Exhaust & Constant Supply Registers with Fire Dampers (CER-FEA-II & CSR-FEA-II)		
		Zoned ventilation for exhaust and supply applications (ZRT)		
		Parallel Damper In-Line Zone Register Terminals (ZRT-PDIL)		
		Commercial heat and energy recovery		
		Constant Exhaust Grilles (CEG-II)		
		Occupancy-Sensing Grilles (OSG)		
		IQ by Aldes Vertical Fan Coil Unit with HRV or ERV (VFU)	- <b>1</b>	
<b>Unitized Solutions</b>		ENERGY STAR <sup>®</sup> Rated Single Port Fans (Ventergy <sup>®</sup> Series)		
	aldes .	Multi-Port Fans (Ventergy <sup>®</sup> Series)		
		Make-up air solutions (AIRLETS™)		
		Multi-family heat and energy recovery (InspirAIR <sup>®</sup> Compact)		

# **Recent Multi-Family Projects**

American Aldes products are in use in hundreds of multi-family dwellings across the country. Our products save building owners and residents money on energy and maintenance costs while providing healthy indoor air for occupants, but don't just take our word for it. Our growing list of satisfied customers is a testament not only to the products themselves but also to our dedication, high quality customer service, and follow through.

Take a look at a **sampling** of the apartments, condos, dormitories, senior living facilities and more that have installed Aldes products recently, and read more about how the Myrtle Avenue Apartments in Brooklyn, New York used Aldes products to become the nation's second multi-family high rise building to receive the ENERGY STAR<sup>®</sup> label.



If you're looking for specific examples of similar projects that use American Aldes products, check out our **Featured Projects Map** on our website. It's a clickable map that you can filter by state, product, sales representative, or project type. Simply select "Multi-Family" under the product category filter to see a sampling of recent projects across the nation.

- Block C Waiea Ward Village, Honolulu, HI-CARs
- The Emerson, Los Angeles, CA-CERs
- The Abigail, Portland, OR-CARs
- Bonaventure of Sparks, Sparks, NV-CERs
- SkyHouse River Oaks, Houston, TX-CARs and Dampers
- Myrtle Terraces, Gainesville, GA-AIRLETS™
- Gateway Hall at the University of Missouri, Columbia, MO-CARs, CERs, and CSRs
- Artistry Apartments, Indianapolis, IN-Ventergy® Series Fans
- Edgewood The Commons, Watertown, SD-HRVs
- 4Marq, Minneapolis, MN-ZRTs and CARs

- Aster Assisted Living, Hartford, WI-CARs
- Madison at Racine, Chicago, IL-ERVs
- 1000 South Clark, Chicago, IL—ZRTs
- 4800 W. George, Chicago, IL-CARs, CERs, and ZRTs
- Woodlawn Park, Chicago, IL-ERVs
- University Hills, Toledo, OH-Ventergy<sup>®</sup> Series Fans and CERs
- Myrtle Avenue Apartments, Brooklyn, NY-CARs
- Centennial Square Phase 2 at High Point University, High Point, NC—ERVs
- Stubbs Hall at Longwood University, Farmville, VA CERs and CSRs
- VITA Tysons Corner Center, Tysons Corner, VA— CARs
- Hollins House Apartments, Baltimore, MD-ERVs
- Masonic Villages of Pennsylvania, Elizabethtown, PA-CERs and CSRs
- Northampton Community College, Bethlehem, PA-ERVs
- Centerbridge, Bridgewater, NJ-CARs
- Front Street Lofts, Hartford, CT-CERs
- One Canal Apartment Homes, Boston, MA—CARs
- Moore House New Hampton School, New Hampton, NH—ERVs
- Valley Vista Senior Apartments, Syracuse, NY—CERs
- USMA Cadet Barracks (The Davis Barracks), West Point, NY-CARs
- Linden Plaza Apartments, Brooklyn, NY-CERs
- 30 Park Place, New York, NY-CARs and ZRTs
- Harlem Canaan House, New York, NY–CERs and CSRs
- Strivers Plaza, New York, NY Ventergy® Series Fans
- Twin Parks North West, Bronx, NY-CERs

# We're no stranger to LEED and ENERGY STAR® projects

### Myrtle Avenue Apartments, Brooklyn, New York

The Dunn Development Corporation, together with Northeast Brooklyn Housing Development Corporation launched an initiative aimed at improving energy performance at a 33-unit apartment building in Brooklyn, New York. The goal was to bring Myrtle Avenue Apartments into accordance with local requirements and reduce the building's energy use by 20% compared to a baseline ASHRAE 90.1-2004 compliant building.

The project was a success and American Aldes was part of the solution; the apartment building became the nation's second multi-family high-rise building to receive the ENERGY STAR® label. One of the energy conservation measures included installing a central exhaust ventilation system with Aldes Constant Airflow Regulators (CAR) dampers at each floor to achieve 25 CFM exhaust ventilation in kitchens and 30 CFM in bathrooms. According to a featured article in *Party Walls* (Volume 3, Issue 5), "Central exhaust systems are one of the biggest drivers of energy and indoor air quality performance in multi-family buildings. Despite the critical nature of these systems, the vast majority do not work as designed in either existing buildings or new construction. As a rule, upper floor apartments (closer to the fan) are over-ventilated, lower floor apartments are under-ventilated...American Aldes Constant Airflow Regulators (CAR) [were used] to balance exhaust ventilation flows from floor to floor." American Aldes is proud to have played a role in this and many other LEED and ENERGY STAR® projects.

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For more information, contact your Aldes sales advisor, visit aldes-na.com, call 1.800.255.7749, or find us on

