

# CONSTANT AIRFLOW REGULATORS PRODUCT BROCHURE



**NEW**



Proudly made in USA

**CAR3<sup>®</sup>**

**PRECISE AIRFLOW**

**#HealthyLiving**





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# CAR3<sup>®</sup>

CONSTANT AIRFLOW REGULATOR

## New Dual Adjustable CAR3 Constant Airflow Regulator

The new model **CAR3** Constant Airflow Regulator is a modulating orifice that automatically regulates airflows in duct systems to constant levels. The passive control element responds to duct pressure and requires no sensors or controls.

The **CAR3** compensates for changes in duct pressure caused by: use of demand control solutions, thermal stack effect and dust-clogged filters as an example. The **CAR3** provides a low-cost solution to balancing forced-air systems for ventilation, heating, and air conditioning, eliminating the need for on-site balancing. The **CAR3** will regulate airflow in supply, return, or exhaust duct systems. The **CAR3** is designed to complement ALDES register assemblies or can fit inside standard rigid round ducting, as well as fittings such as take-offs, tees, etc. with a double lip gasket around the circumference ensuring a tight, no-leak fit.

The active control element of the **CAR3** is a engineered damper assembly which is calibrated to respond to changes in pressure with no input from an external power source or signal. Operations of the damper assembly regulates the free-areas opening in relation to duct pressure, creating the necessary duct pressure drop to maintain set air flow rates as specified. The **CAR3** is UL 2043 safety classified and labeled for flame and smoke generation.

The **CAR3** airflow regulators control airflow accurately to within 10% of rated flow throughout the target operating pressure ranges; 0.12 to 1.2 in. w.g. (30 to 300 Pa) for low pressure models (CAR3-L), and 0.4 to 2.8 in. w.g. (100 to 650 Pa) for high pressure models (CAR3-H). Airflow set point is selected by turning the adjustment dial on either side (supply or exhaust) of the **CAR3**. The indicator shows the selected CFM. Each diameter of **CAR3** has a unique airflow range for both low- and high-pressure variants, and the setpoint is infinitely adjustable across those ranges. Factory calibration of **CAR3** is available on request.

# #HealthyLiving



For more than 35 years, Aldes North America has resolved challenging indoor air quality issues by taking a “systems approach” to ventilation. Aldes North America products are designed for superior airflow control, energy-efficient performance, and a healthy indoor environment.

Aldes North America has specialty ventilation products for single-family homes all the way to towering high-rise buildings. Builders seeking LEED project credits or designers working within challenging constraints will find Aldes North America products are cost effective and suited to their ventilation and indoor air quality needs. When designing your ventilation solution, the experts at Aldes consider many building factors: environmental conditions, building type, occupant demographics, local codes and regulations, as well as budget considerations. This thorough analysis ensures that the product you receive will be a tailored solution for long-lasting performance. We want you to be confident in your choice; from the moment you make the selection to years after installation. Every Aldes product is equal parts innovation and experience. Your business is our pleasure. Your satisfaction is our priority.

# PRECISE AIRFLOW IS THE SIMPLE SOLUTION.

**Quick and easy to install, the CAR3 saves cost, and easy to maintain. Plus, it's made in the USA.**

## EASY TO ADJUST

Adjust from supply or exhaust

## UL 2043

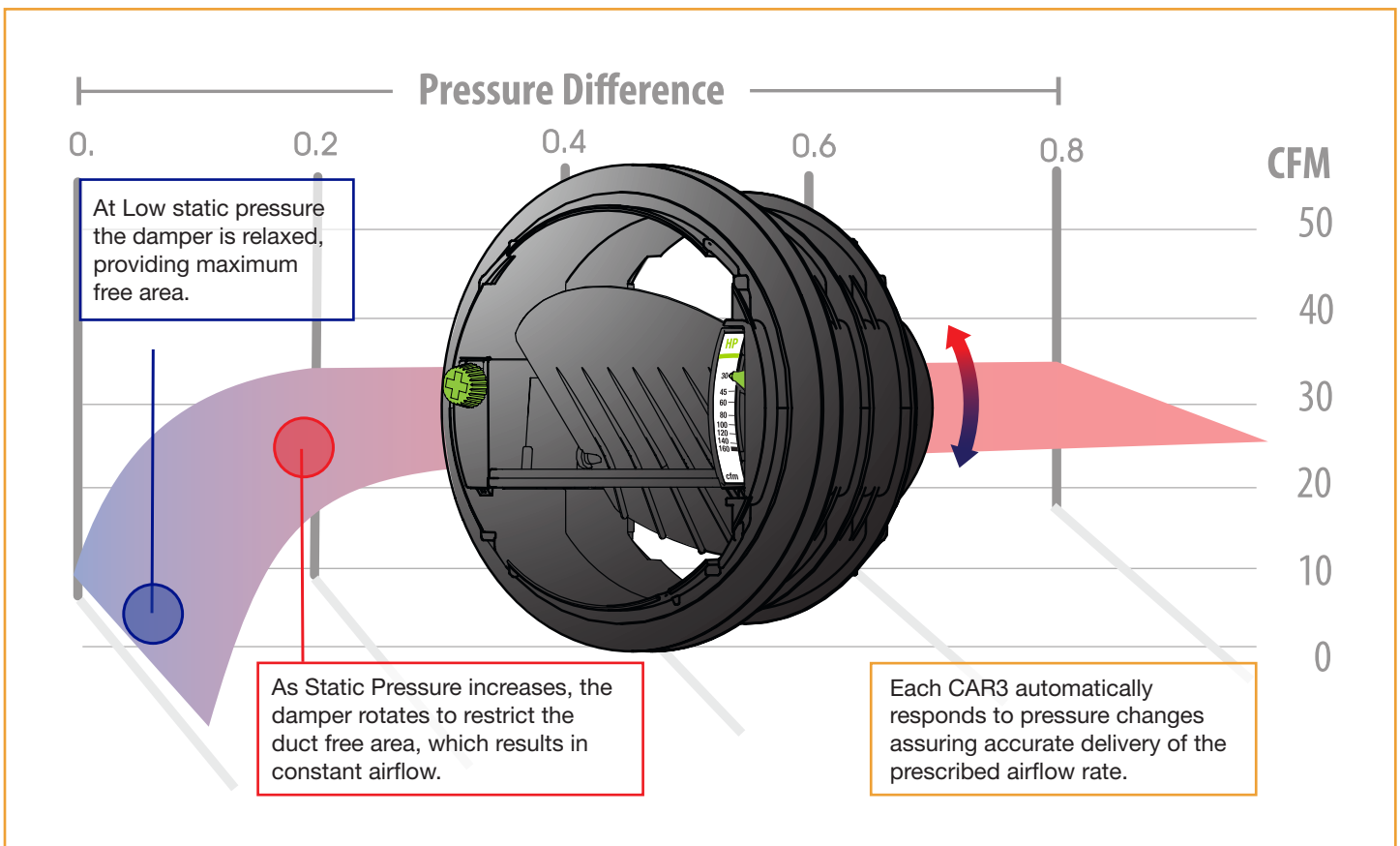
Safety Classified





## HOW THE CAR3 WORKS

Constant airflow is achieved by controlling the free area through the device. At minimum static pressure, the damper is relaxed. As the static pressure increases, the damper will rotate, reducing the amount of free area through the regulator resulting in CONSTANT AIRFLOW. This occurs regardless of pressure differences in the range of 0.12 to 1.2 in.w.g. (30 to 300 Pa) for the low-pressure and 0.4 to 2.8 in.w.g. (100 to 650 Pa) for the high-pressure.



Made in USA

WARRANTY 7 YEARS



Patent pending

## CAR3 DETAILS OF THE AIRFLOW REGULATOR MODEL

### Adjustment dial

Dual-side airflow adjustment dial and CFM indicator allows you to set or change the airflow quickly, in supply or exhaust applications, without removing the CAR3 from the duct.

- Easy to handle with or without tool.

### Gasket

Double lip gasket around the circumference ensures a tight, no-leak fit.

### Airflow

- Infinitely variable between the range.
- Value indicator visible on both sides of the product.



**BLUE COLOR = LOW-PRESSURE**  
LOW: 0.12 to 1.2 in. w.g. (30 to 300 Pa)

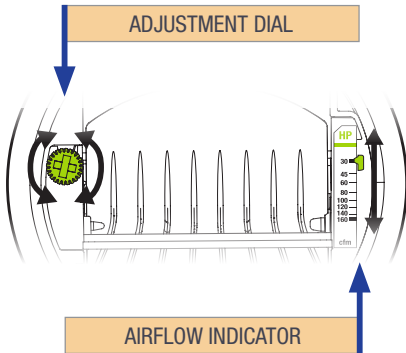


**GREEN COLOR = HIGH-PRESSURE**  
HIGH: 0.4 to 2.8 in. w.g. (100 to 650 Pa)

## CAR3 TYPICAL APPLICATIONS

- Automatic balancing damper.
- New construction or retrofit.
- Supply and exhaust air in offices.
- Balancing exhaust/return and supply airflows in high-rise building duct risers, common areas, and living spaces.
- Regulation of make-up air.
- Bathroom exhaust in nursing homes, hotels, motels, dormitories, apartment buildings, offices, etc.
- Clean room air supply balancing for ceiling filter modules. Maintains constant airflow even as filter resistance increases.
- Balancing supply airflow from packaged roof-top A/C units.
- Balancing supply and exhaust/return of heat recovery ventilation systems.
- Regulating outdoor air injection from central supply fan into individual room fan coil units or heat pumps.

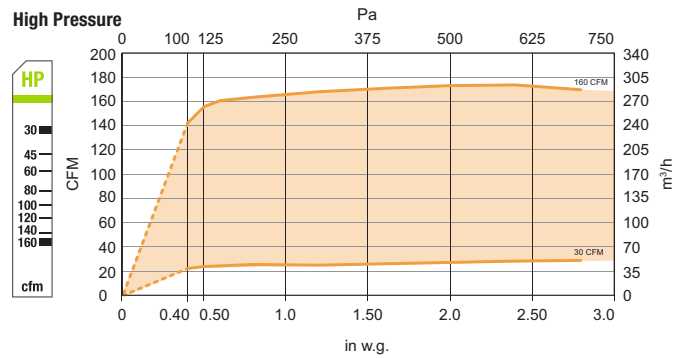
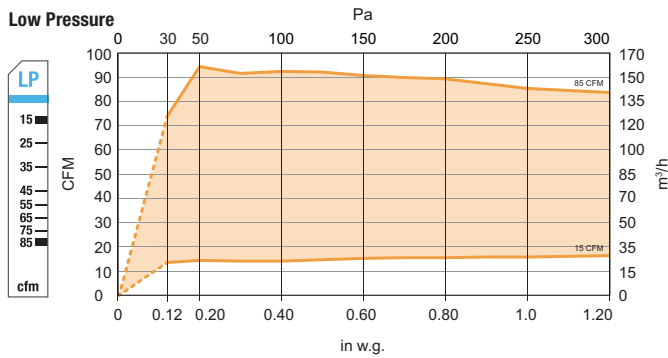
### AIRFLOW SETTINGS & PERFORMANCE DATA



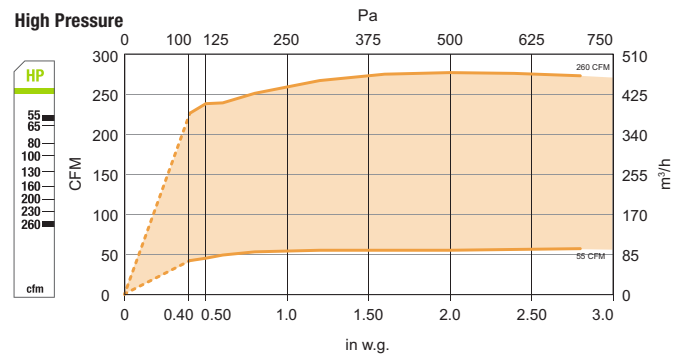
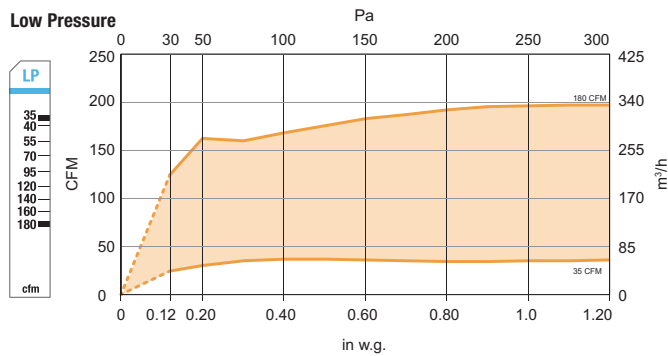
Airflow rate can be set or adjusted by rotating the dial from either side. The airflow indicator will move to show the selected CFM. The airflow label has multiple defined setpoints, but the unique adjustment mechanism of the CAR3 allows for infinite adjustability between the minimum and maximum limits.

Performance charts found in the specifications sheet reflect this data, with the available range. The CAR3 will maintain the airflow accurately to within +/- 10% of the indicated lines below for each marked setpoint. At the higher airflow rates, the minimum pressure required to achieve the selected airflow may exceed 0.12 in.w.g.

#### CAR3 4" DIAMETER (100 mm)



#### CAR3 5" DIAMETER (125 mm)





## HOW TO SPECIFY ALDES: CAR3

- Step 1:** Reference the model code below and performance details within this specifications sheet to select the appropriate CAR3.
- Step 2:** Determine the required PRESSURE RANGE for the CAR3 based on the anticipated external static pressure of the system at the installed CAR3 location.
- Each diameter has a unique range for both low- and high-pressure variants. The CAR3-L (low-pressure) is designed for systems with pressures between 0.12 and 1.2 in. w.g. (30 to 300 Pa), and CAR3-H (high-pressure) between 0.4 and 2.8 in. w.g. (100 to 650 Pa). Factory calibration of the CAR3 is available on request.
- Step 3:** Select the desired AIRFLOW RANGE. There are 3 ranges available: 4, 5, or 6. Each regulator is infinitely adjustable within their range.
- Step 4:** Select the ROUND DUCT SIZE. This number cannot be less than the AIRFLOW RANGE: i.e. 5 requires a selection of at least 5 inch round duct, and can be at most 6 inches, but can not be 4 inches.

### MODEL CODE EXAMPLE

## CAR3-L4-R4

#### PARENT MODEL

Constant Airflow Regulator

#### PRESSURE RANGE

L: Low-Pressure (0.12-1.2 in. w.g.)  
H: High-Pressure (0.4-2.8 in. w.g.)

#### AIRFLOW RANGE

Low Pressure  
4: 15-85 CFM (25-144 m<sup>3</sup>/h)  
5: 35-180 CFM (59-306 m<sup>3</sup>/h)  
6: 45-260 CFM (76-442 m<sup>3</sup>/h)  
High Pressure  
4: 30-160 CFM (51-272 m<sup>3</sup>/h)  
5: 55-260 CFM (93-442 m<sup>3</sup>/h)  
6: 60-370 CFM (102-629 m<sup>3</sup>/h)

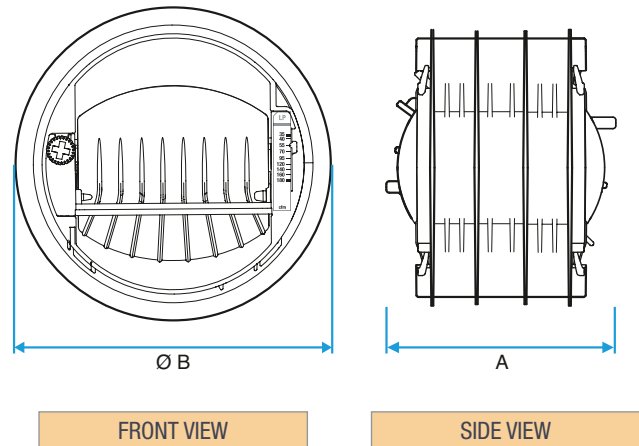
#### ROUND DUCT SIZE

R4: 4 inch  
R5: 5 inch  
R6: 6 inch



CAR3 with Duct Size Adapters.  
Color indicate ring sizes.

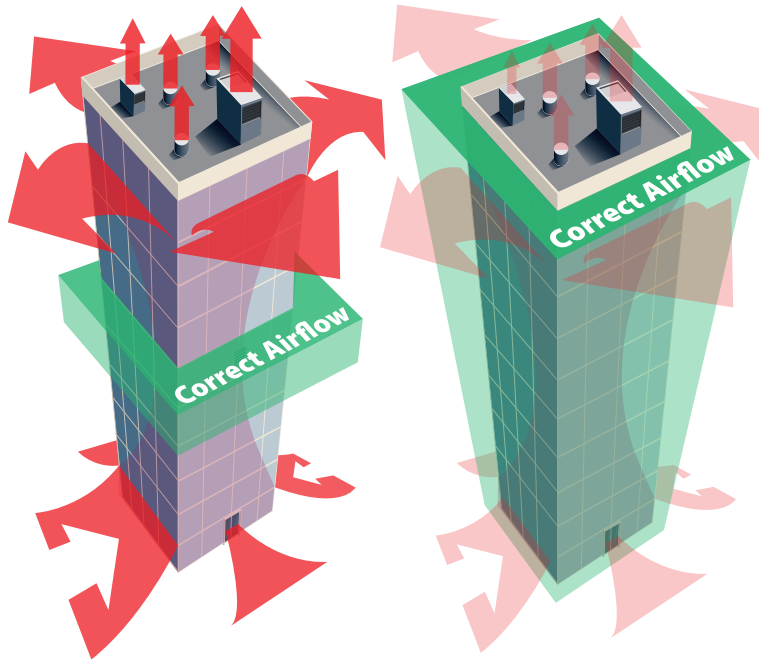
### DIMENSIONS



Duct Size	A	ØB
4" (100 mm)	3" (78 mm)	4.3" (108 mm)
5" (125 mm)	3.8" (97 mm)	5.2" (132 mm)
6" (150 mm)	4.6" (118 mm)	6.0" (153 mm)

When necessary, CAR3 will be provided with duct size adapters to increase their size for larger round duct applications. Each ring increases the CAR3 diameter by one inch, and multiple rings can be used with a maximum size of 6 inches.

## CONSTANT AIRFLOW REGULATION



Before CAR3 Installation

After CAR3 Installation

Supply and return/exhaust airflow for each area is automatically balanced by installing the CAR3 in the branch ducts or terminal device locations. CAR3 are commonly used in heat and energy recovery systems to ensure maximum efficiency.

**Stack effect** occurs when air is heated and rises in the shaft forcing more air in the lower floors and out the top floors. 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 which 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 CAR3 at each grille or diffuser location eliminates stack effect on the ventilation system.

## COST SAVING

Good IAQ on every floor.

## ZONE CONTROL



Airflow controlled by CAR3. ZRT shown.

Motorized dampered zoning systems can be plagued by wide variations in duct pressure resulting in little to no control over airflow delivery rates. The pressure-independent CAR3 keeps airflow rates constant on demand. For added flexibility in systems requiring zoning, ALDES Zone Register Terminals provide simple demand control solutions for a wide variety of applications, from in-suite hotel ventilation solutions, to multi-family bathroom exhaust and makeup air, and commercial demand control requirements to meet code.



## CASE STUDY

In October 2008, the NAHB Research Center published a case study that showed conclusively how installing ALDES Constant Airflow Regulators improves airflow 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 provides “considerable operating cost savings,” with **“over 27% energy savings”**.

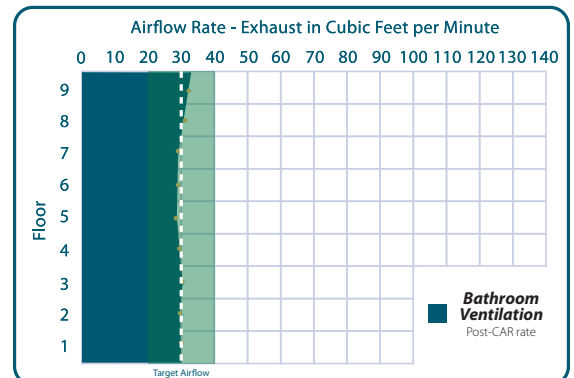
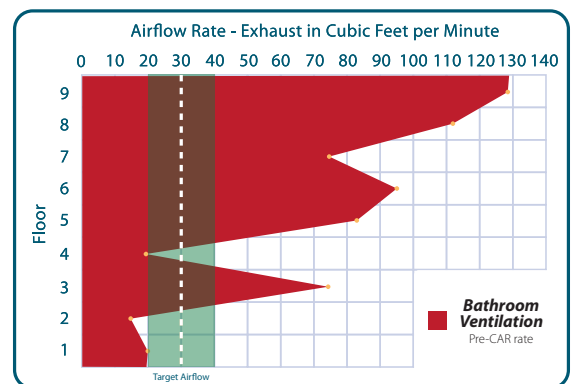
Airflow data for each floor from Partnership for Advancing Technology in Housing’s Final Report on the Evaluation of Constant Airflow Regulators (CAR) in Multi-Family, Multi-Story Central Ventilation Systems, (October 2008). Provided by the NAHB Research Center.

### **BEFORE (RED CHART)**

Bathrooms in the building were over-ventilated by ~150% in over 60% of all apartments. This represents a serious waster of energy in addition to inflated operations costs. Bathrooms were under ventilated in just over 30% of all apartments, posing a serious Indoor Air Quality issue. Only 10% of the units were being properly ventilated per code.

### **AFTER (BLUE CHART)**

When the NAHB Research Center visited the site to follow up, they calculated the installation of ALDES CAR generated an energy savings of over 27%.

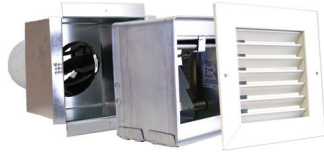


### CONSTANT EXHAUST REGISTER (CER) & CONSTANT SUPPLY REGISTER (CSR) ASSEMBLIES



CER3-S

Square or Rectangle Duct



CER3-S-F

Fire Damper Included

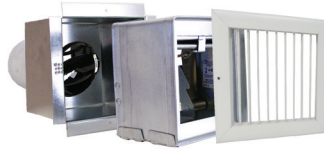


CER3-R

Round Duct



CSR3-S



CSR3-S-F

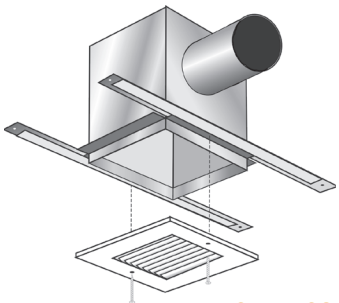


CSR3-R

#### APPLICATIONS

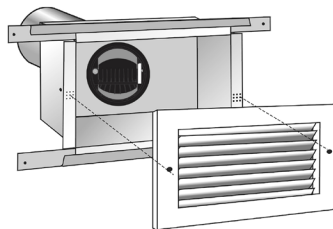
- Automatic balancing grille assembly for square, rectangle, round duct.
- Balance exhaust/return or supply duct in high-rise buildings.
- Balance exhaust/return or supply to common areas & living spaces.

### CONSTANT EXHAUST BOX (CEB) & CONSTANT SUPPLY BOX (CSB) ASSEMBLIES



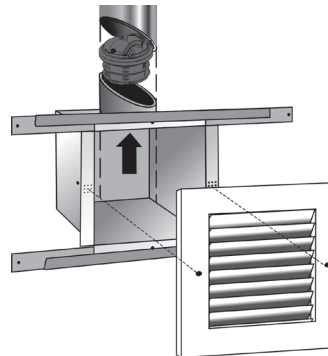
CEB3-CS  
CSB3-CS  
CEB3-CS-F  
CSB3-CS-F

Ceiling Side  
(with optional ceiling radiation damper)



CEB3-WB  
CSB3-WB

Wall Back



CEB3-WS  
CSB3-WS

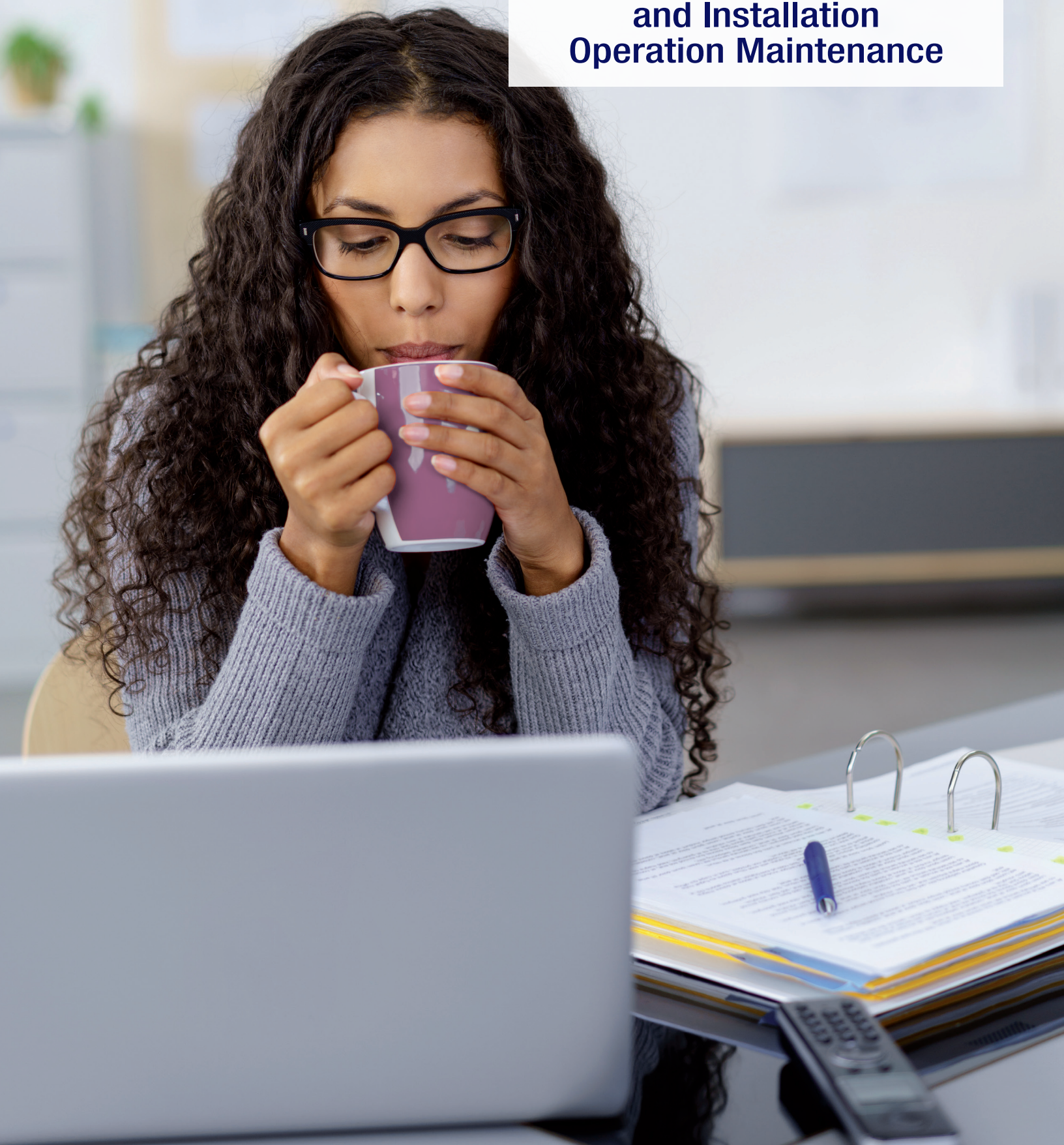
Wall Side

#### APPLICATIONS

- Automatic balancing register box assembly for ceiling or wall installation.
- Balance exhaust/return or supply air in high-rise buildings.
- Ideal for hotels, dorms, and assisted living facilities

# CAR3

**Product Specifications &  
Technical Data  
and Installation  
Operation Maintenance**





# CAR3

## CONSTANT AIRFLOW REGULATOR

### AIRFLOW & ZONE CONTROL



## Product Description

The Aldes CAR3 Constant Airflow Regulator is a pressure independent balancing damper that automatically regulates airflow in duct systems to constant levels. The CAR3 requires no electric or pneumatic power or sensors, and works solely off system pressure.

Unlike traditional manual dampers, the CAR3 compensates for changes in duct pressure caused by stack effect, operable windows and doors, wind, loading filters, etc. The CAR3 provides a low-cost solution to maintaining the correct airflow balance of ventilation systems, improving system performance and indoor air quality, which can provide significant savings on annual operating costs.

## Key Features

- Dual-side airflow adjustment dial and CFM indicator allows you to set or change the airflow quickly, in supply or exhaust applications, without removing the CAR3 from the duct.
- Modulating rotary damper automatically responds to changes in duct pressure to maintain set flow.
- Resin is enhanced with antimicrobial, anti-static, and flame retardant additives for increased safety and durability.

## APPLICATIONS

- Automatic balancing of round duct.
- Balance supply or exhaust/return duct in high-rise building.
- Sized to fit inside standard rigid round ducting, take-offs, tees, and more.
- New construction or retrofit.

## Construction

- CAR3 constructed of amorphous thermoplastic resin enhanced with antimicrobial, anti-static, and flame retardant additives to improve material performance, reduce need for maintenance, and increase safety.
- CAR3 is UL 2043 safety classified and labeled for flame and smoke generation (File No. R39897).
- Double lip gasket around the circumference ensures a tight, no-leak fit.

## Maintenance

The CAR3 needs no maintenance when used in normal conditions. The addition of antimicrobial and anti-static additives in the material increases the longevity and reliability of the CAR3. There is no risk of dust deposit or obstruction because the CAR3 has no airways subject to clogging. If the intended application includes air heavily loaded with dust or grease, access to the CAR3 will be possible by removing the grille.

## Warranty

Guaranteed for 7 years, from date of shipment, against all defects in material or workmanship, provided that the material has been installed and used under normal conditions. This warranty is limited to the repair or replacement of the material.

# CAR3

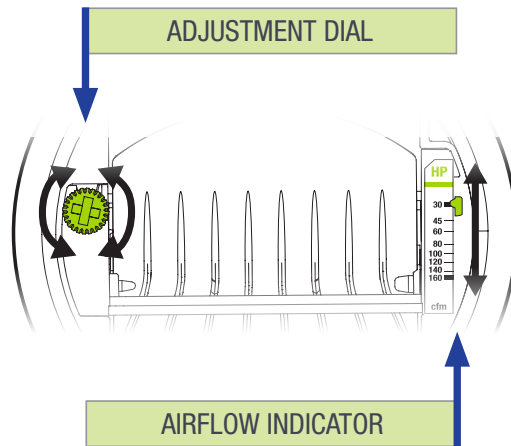
Constant Airflow Regulator

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[www.aldes-na.com](http://www.aldes-na.com)

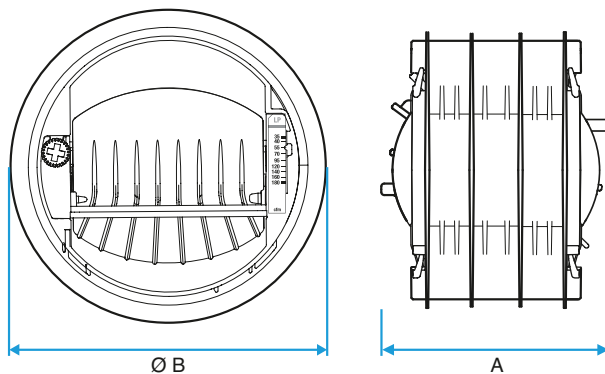
# 1. AIRFLOW SETTING



Airflow rate can be set or adjusted by rotating the dial from either side. The airflow indicator will move to show the selected CFM. The airflow label has multiple defined setpoints, but the unique adjustment mechanism of the CAR3 allows for infinite adjustability between the minimum and maximum limits. Performance charts found in the specifications sheet reflect this data, with the available range (shaded) and marked setpoints (lines). The CAR3 will maintain the airflow accurately to within +/- 10% of the indicated lines below for each marked setpoint. At the higher airflow rates, the minimum pressure required to achieve the selected airflow may exceed 0.12 in. w.g.

Each diameter has a unique range for both low- and high-pressure variants. The CAR3-L (low-pressure) is designed for systems with pressures between 0.12 and 1.2 in. w.g. (30 to 300 Pa), and CAR3-H (high-pressure) between 0.4 and 2.8 in. w.g. (100 to 700 Pa). Factory calibration of the CAR3 is available on request. Blue color dial = Low-Pressure / Green color dial = High-Pressure.

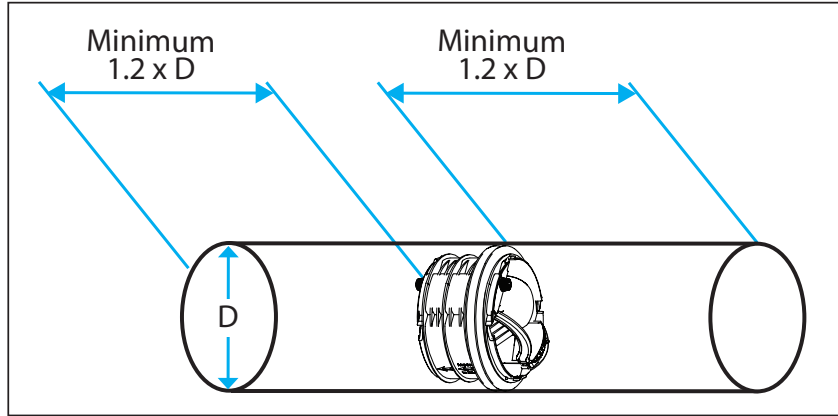
# 2. DIMENSIONS



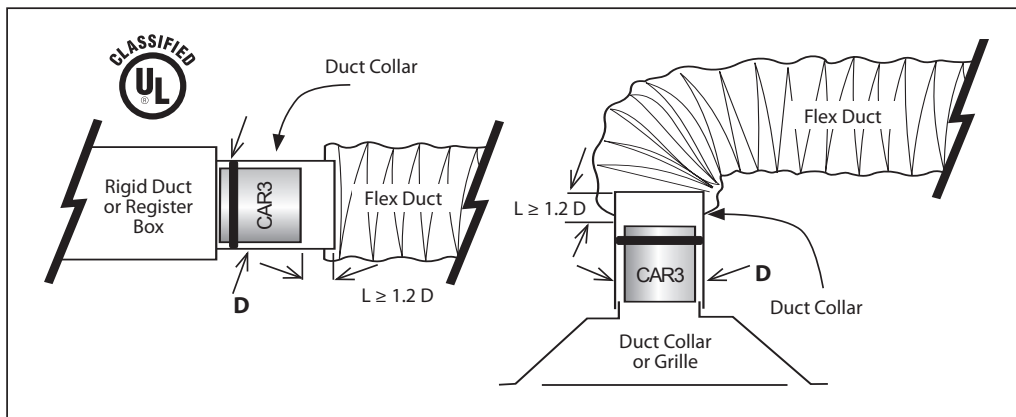
Size	A	Ø B	Low-Pressure (Blue) 0.12-1.2 in. w.g (30-300 Pa)		High-Pressure (Green) 0.4-2.8 in. w.g (100-700 Pa)	
			Airflow	P/N	Airflow	P/N
4" (100 mm)	3"	4.3"	15-85	CAR3L4R4	30-160	CAR3H4R4
5" (125 mm)	3.8"	5.2"	35-180	CAR3L5R5	55-260	CAR3H5R5
6" (150 mm)	4.6"	6.0"	45-260	CAR3L6R6	60-370	CAR3H6R6



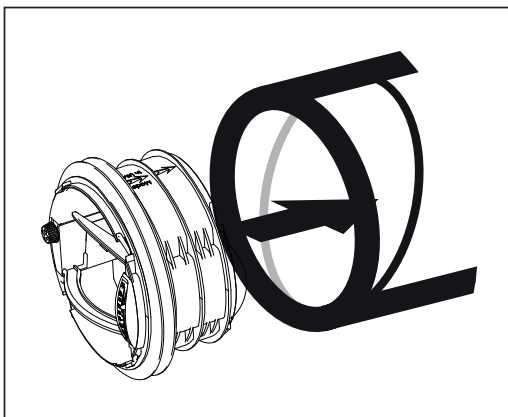
### 3. INSTALLATION



Regulator must be installed in a metallic air duct as pictured above. D represents the regulators maximum outer diameter.



The CAR3 should be installed in accordance with all applicable building and mechanical codes. If installed in a metal duct or duct collar with a flexible duct connector (listed to UL 2043), the CAR3 must be inserted at least 1.2 times the duct diameter from the flexible duct and/or duct connector.



Orient the CAR3 according to the airflow direction indicated on the device. Horizontal or vertical mounting is acceptable.



## 4. MAINTENANCE & WARRANTY

- The CAR3 needs no maintenance when used in normal conditions. The addition of antimicrobial and anti-static additives in the material increases the longevity and reliability of the CAR3. There is no risk of dust deposit or obstruction because the CAR3 has no airways subject to clogging. If the intended application includes air heavily loaded with dust or grease, access to the CAR3 should be possible through the terminal device or with an access panel or door.
- ALDES Ventilation Corporation warrants the CAR3 to be free from manufacturing defects and guarantees the performance within specified limits for a period of seven (7) years when installed in normal environmental air systems for general residential and commercial heating, ventilating and air conditioning. This warranty does not include installation in industrial applications or caustic, noxious or otherwise hazardous airhandling equipment. This warranty is limited to replacement of the product only and does not extend to consequential claims.

## 5. TROUBLESHOOTING

PROBLEM	CAUSE	SOLUTION
<b>AIRFLOW TOO LOW</b>	Insufficient duct pressure.	Check fan ratings. Replace fan if too small Increase fan speed.
	Excessive duct air leakage.	Seal ducts with mastic or tape.
	CAR3 damper not functioning properly.	Check CFM calibration on CAR3. Adjust to proper airflow value.
<b>AIRFLOW TOO HIGH AND/ OR NOISY OPERATION</b>	CAR3 too close to fan.	Add manual damper to reduce pressure across CAR3 to normal operating range.
	Fan at too high a speed.	Lower fan speed.
	CAR3 damper not functioning properly.	Check CFM calibration on CAR3. Adjust to proper airflow value.

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Aldes North America

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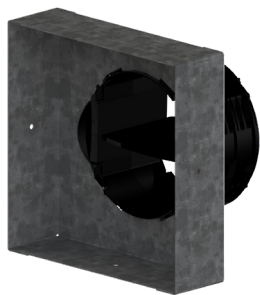
[www.aldes-na.com](http://www.aldes-na.com)



CAR3 IOM\_USA\_0620

MODEL CONFIGURATIONS

Model	Use		Duct Type		Fire Damper
	Exhaust	Supply	Round	Square/ Rectangular	
CAR3	√	√	√		
CAR3-S	√	√		√	
CER3-S	√			√	
CSR3-S		√		√	
CER3-S-F	√			√	√
CSR3-S-F		√		√	√
CER3-R	√		√		
CSR3-R		√	√		
<b>REGISTER BOXES</b>					
CEB3-WS	√		√		
CSB3-WS		√	√		
CEB3-WB	√		√		
CSB3-WB		√	√		
CEB3-CS	√		√		
CSB3-CS		√	√		
CEB3-CS-F	√		√		√
CSB3-CS-F		√	√		√



CAR3-S



CER3-S



ZRT®

# #HealthyLiving

Engineering tomorrow's solutions is more than an idea – it is a guiding principle. Every Aldes product is equal parts innovation and experience. Efficient and respectful solutions of the environment which allow to renew and purify the indoor air delivering improved air quality. From automatic airflow controls to advanced heat and energy recovery ventilators, Aldes products can be found in high-performing homes, schools, hotels and buildings across North America. Healthy Living, much more than a movement, embody our benevolence, our sense of responsibility and pioneering spirit.



For more information, contact your  
Aldes sales advisor, visit [aldes-na.com](http://aldes-na.com),  
or find us on



Aldes North America  
USA 800.255.7749 CAN 800.262.0916