



## CONSTANT AIRFLOW REGULATORS

---



**NEW**



**CAR3®**

PRECISE AIRFLOW

Proudly made in USA

TECHNICAL DOCUMENTATION





## CONTENTS

|                                       |      |
|---------------------------------------|------|
| HOW THE CAR3 WORKS.....               | P 6  |
| CAR3 DETAILS .....                    | P 7  |
| AIRFLOW SETTINGS & PERFORMANCE DATA.. | P 8  |
| HOW TO SPECIFY ALDES: CAR3.....       | P 10 |
| MODEL CODE EXAMPLE.....               | P 10 |
| DIMENSIONS .....                      | P 10 |
| CONSTANT AIRFLOW REGULATION .....     | P 11 |
| ZONE CONTROL .....                    | P 11 |
| TYPICAL APPLICATIONS .....            | P 12 |
| CASE STUDY .....                      | P 15 |
| CER & CSR ASSEMBLIES.....             | P 16 |
| CAR3 SPEC SHEET .....                 | P 18 |
| CAR3 IOM .....                        | P 19 |
| MODEL CONFIGURATIONS.....             | P 23 |



# 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.







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

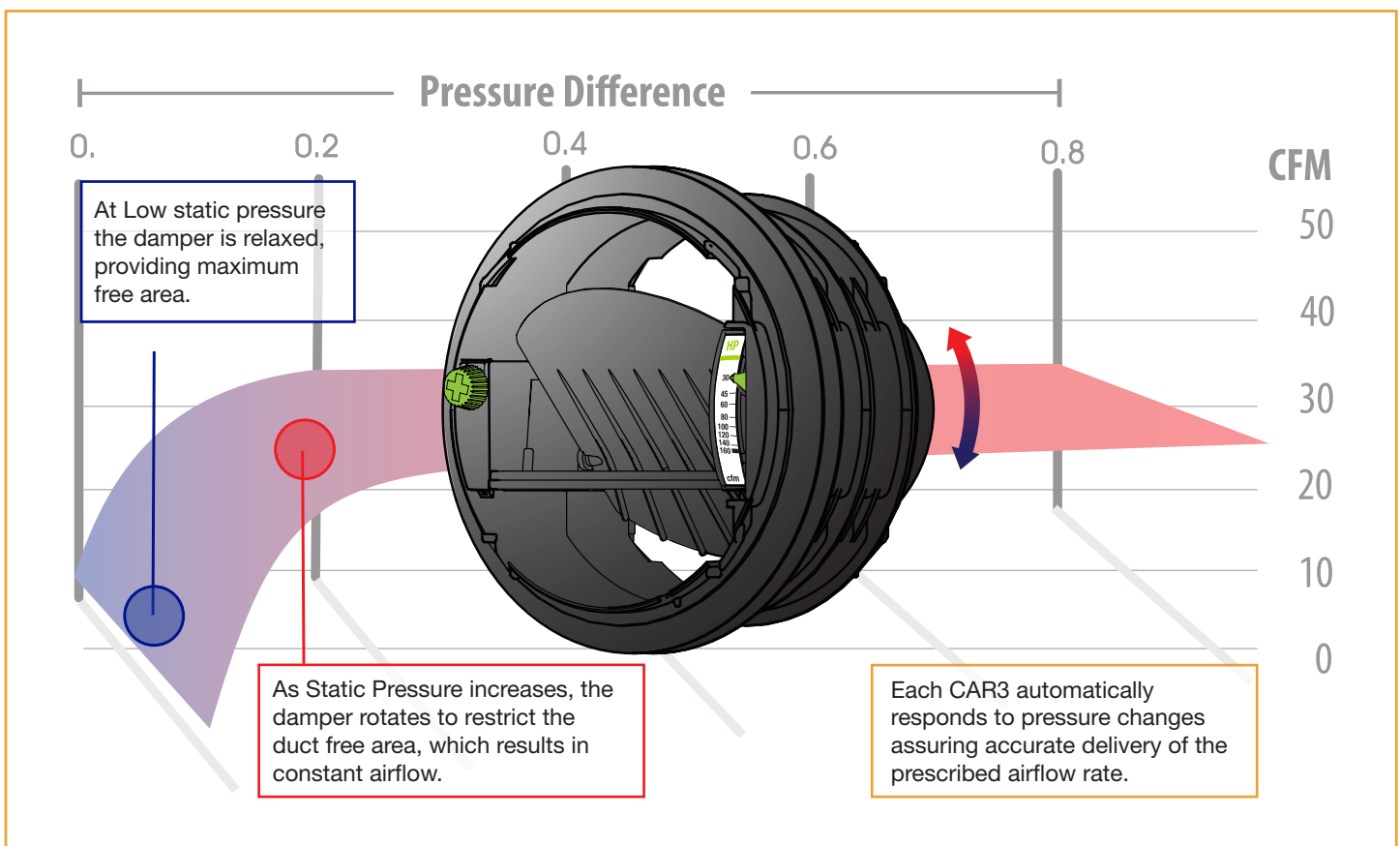






## HOW THE CAR3 WORKS

Constant airflow is achieved by controlling the free area through the device. At minimum static pressure, the damper is relaxed, providing maximum free area. 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.





## CAR3 DETAILS OF THE AIRFLOW REGULATOR MODEL

Made in  
**USA**

WARRANTY  
**7 YEARS**



Patent  
pending

### 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.



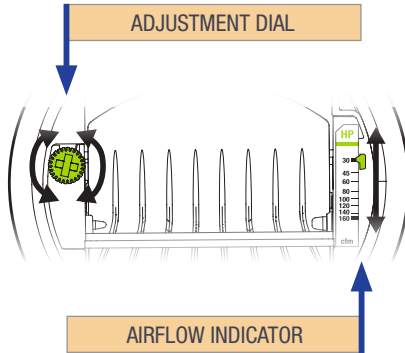
**BLUE COLOR = LOW-PRESSURE**  
LOW: 0.12 to 1.2 in. w.g. (30 to 300 Pa)



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



## AIRFLOW SETTINGS & PERFORMANCE DATA

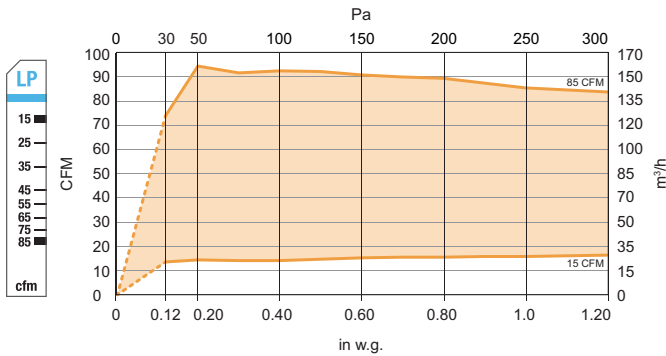


Airflow rate can be set or adjusted by rotating the dial from either side. The airflow indicator will move to show the selected CFM. The airflow label has multiple defined setpoints, but the unique adjustment mechanism of the CAR3 allows for infinite adjustability between the minimum and maximum limits.

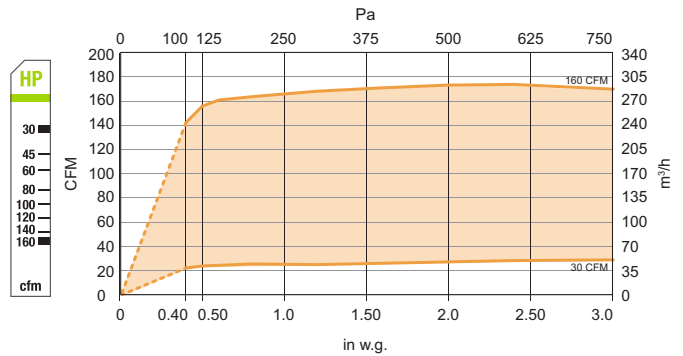
Performance charts found in the specifications sheet reflect this data, with the available range. The CAR3 will maintain the airflow accurately to within  $\pm 10\%$  of the indicated lines below for each marked setpoint. At the higher airflow rates, the minimum pressure required to achieve the selected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

### CAR3 4" DIAMETER (100 mm)

Low Pressure

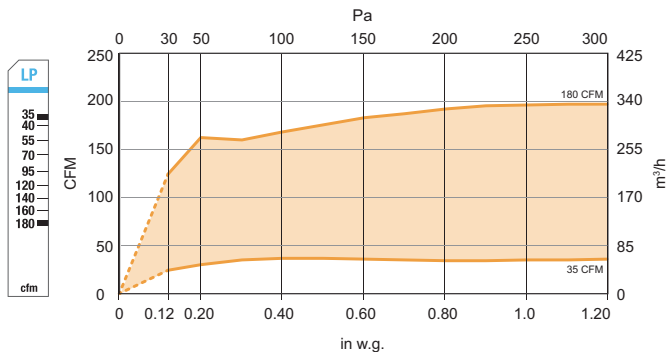


High Pressure

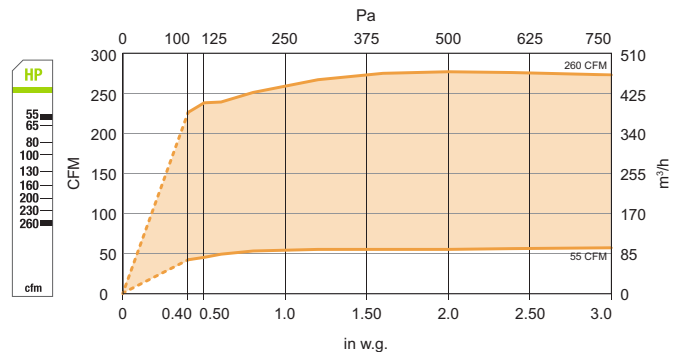


### CAR3 5" DIAMETER (125 mm)

Low Pressure



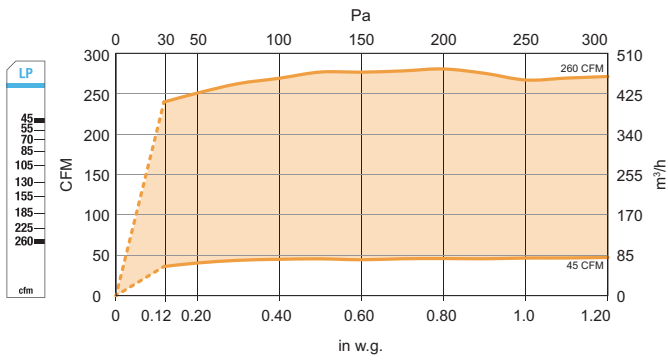
High Pressure



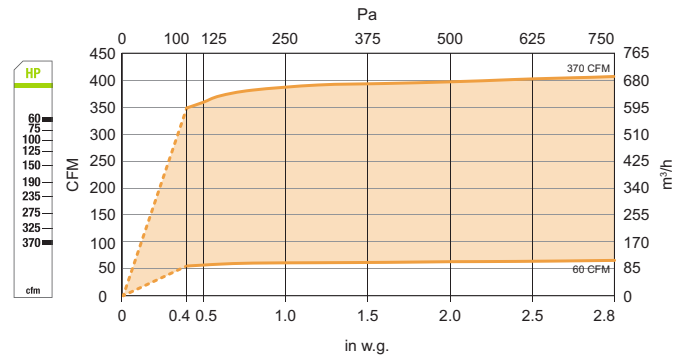


## CAR3 6" DIAMETER (150 mm)

Low Pressure

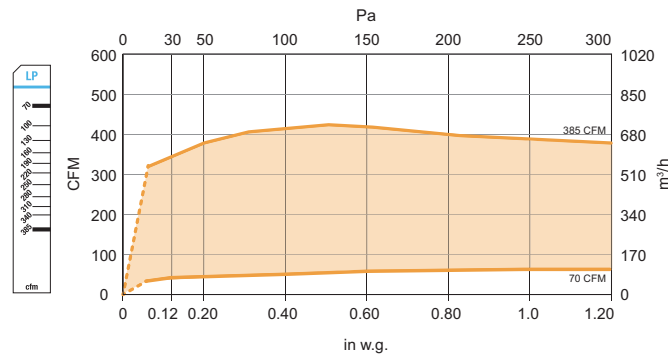


High Pressure

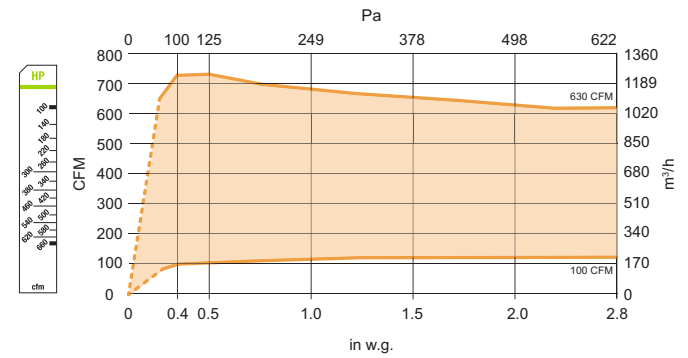


## CAR3 8" DIAMETER (200 mm)

Low Pressure

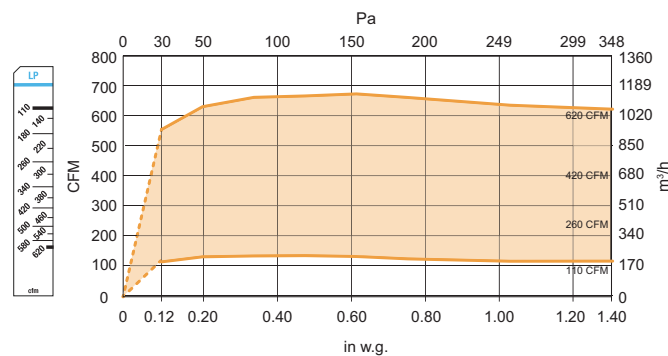


High Pressure

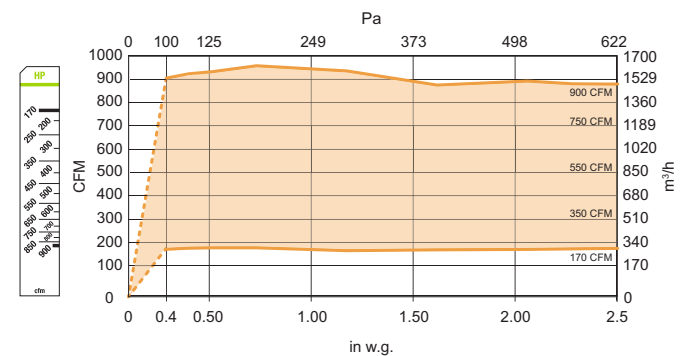


## CAR3 10" DIAMETER (250 mm)

Low Pressure



High Pressure



Airflow measurements taken at 68°F (20°C) at 1 atmosphere pressure.



## 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. 4, 5, 6, 8 or 10. 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 m³/h)

5: 35-180 CFM (59-306 m³/h)

6: 45-260 CFM (76-442 m³/h)

8: 70-385 CFM (119-655 m³/h)

10: 110-620 CFM (187-1053 m³/h)

## High-Pressure

4: 30-160 CFM (51-272 m³/h)

5: 55-260 CFM (93-442 m³/h)

6: 60-370 CFM (102-629 m³/h)

8: 130-630 CFM (220-1070 m³/h)

10: 170-900 CFM (289-1529 m³/h)

## ROUND DUCT SIZE

R4: 4 inch

R5: 5 inch

R6: 6 inch

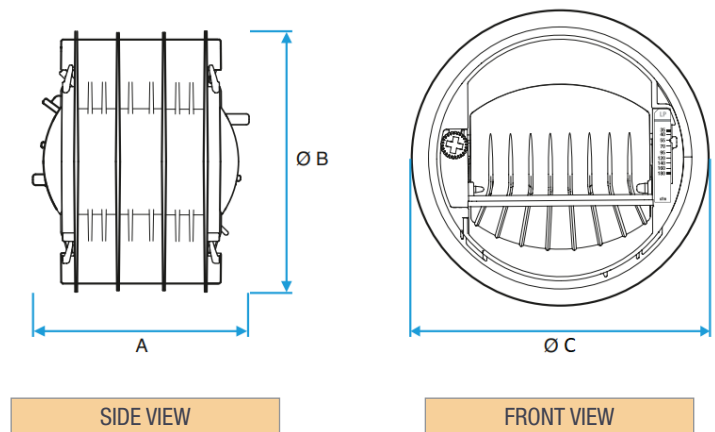
R8: 8 inch

R10: 10 inch



CAR3 with Duct Size Adapters.  
Color indicate ring sizes.

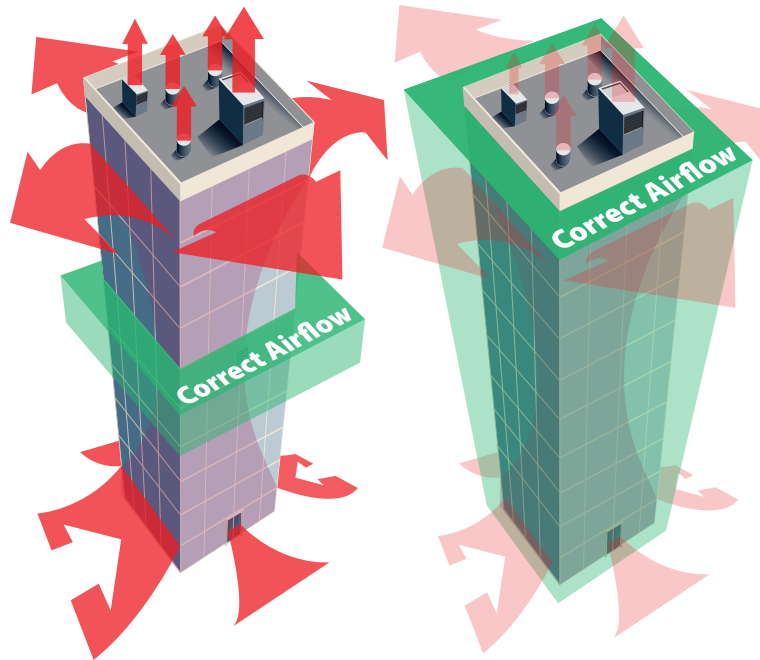
## DIMENSIONS



| Duct Size       | A                | ØB               | ØC                |
|-----------------|------------------|------------------|-------------------|
| 4"<br>(100 mm)  | 3"<br>(78 mm)    | 3.8"<br>(97 mm)  | 4.1"<br>(104 mm)  |
| 5"<br>(125 mm)  | 3.8"<br>(97 mm)  | 4.8"<br>(121 mm) | 5.2"<br>(132 mm)  |
| 6"<br>(150 mm)  | 4.6"<br>(118 mm) | 5.8"<br>(148 mm) | 6.1"<br>(155 mm)  |
| 8"<br>(200 mm)  | 6.7"<br>(170 mm) | 7.7"<br>(196 mm) | 8.2"<br>(208 mm)  |
| 10"<br>(250 mm) | 8.3"<br>(211 mm) | 9.6"<br>(244 mm) | 10.2"<br>(259 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.



## **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.







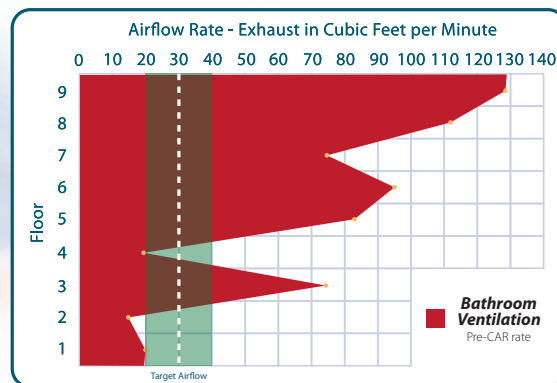
## CASE STUDY

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.

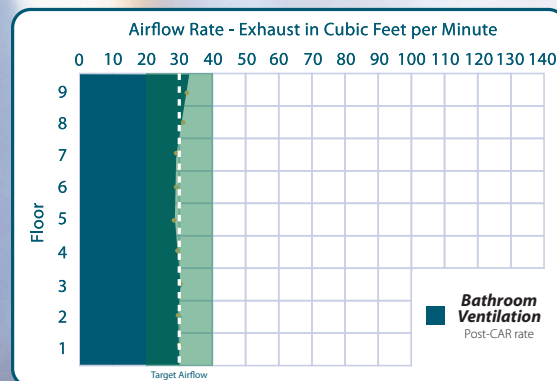
### BEFORE (RED CHART)

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

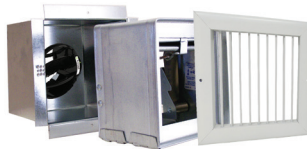
Round Duct

### 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.



CSR3-S

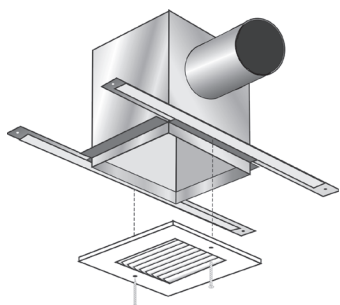


CSR3-S-F



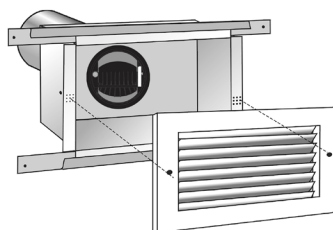
CSR3-R

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



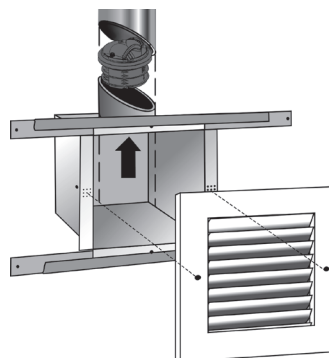
CEB3-CS  
CSB3-CS  
CEB3-CS-F  
CSB3-CS-F

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

Made in  
USA

WARRANTY  
7 YEARS



Patent  
pending

## 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

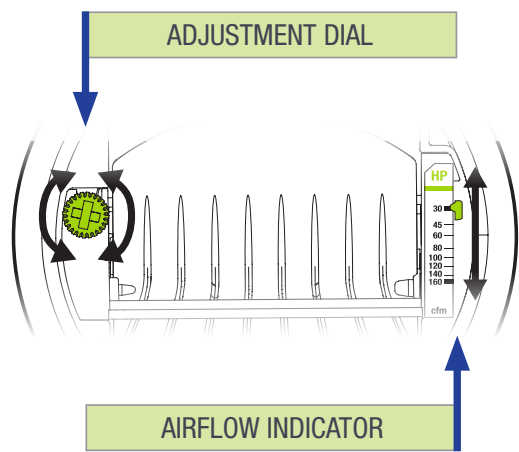


Made in  
USA

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



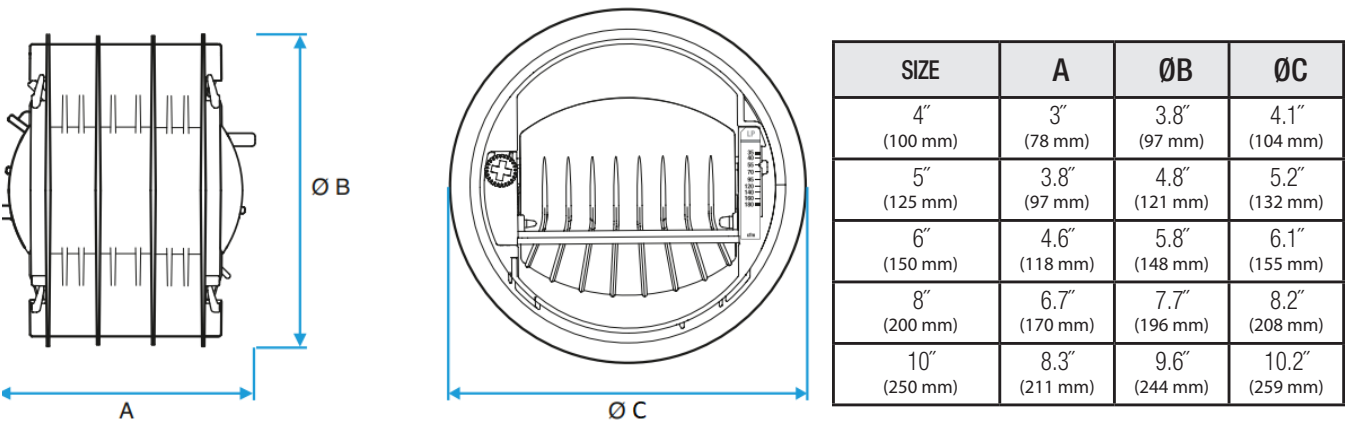
# 1. AIRFLOW SETTING



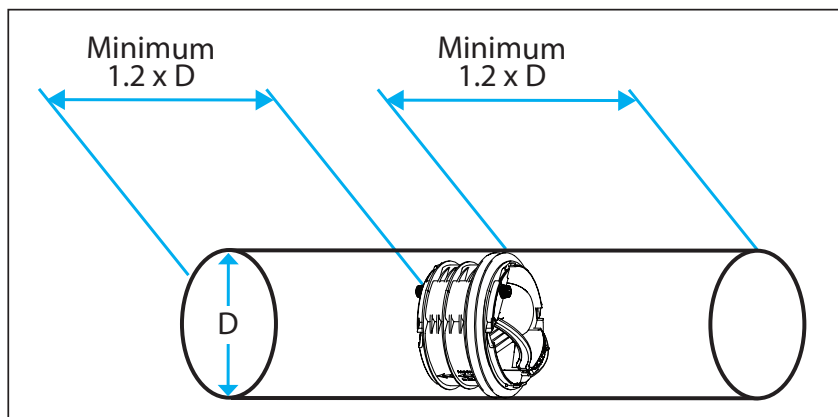
Airflow rate can be set or adjusted by rotating the dial from either side. The airflow indicator will move to show the selected CFM. The airflow label has multiple defined setpoints, but the unique adjustment mechanism of the CAR3 allows for infinite adjustability between the minimum and maximum limits.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

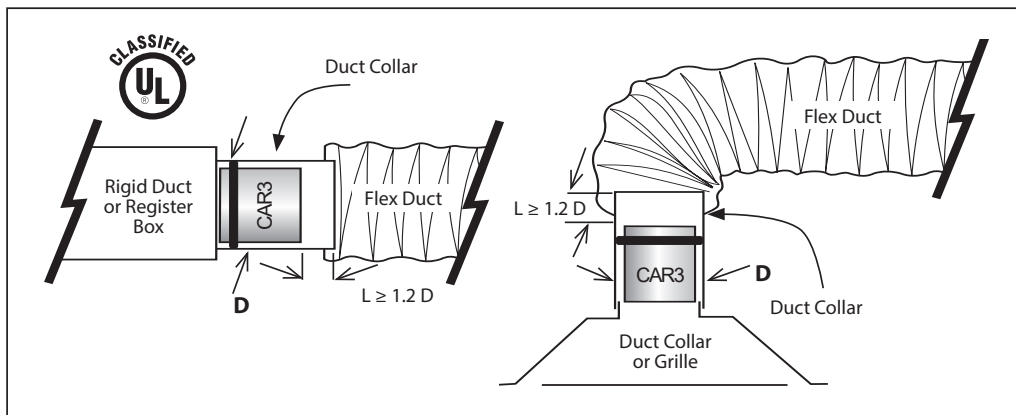
# 2. DIMENSIONS



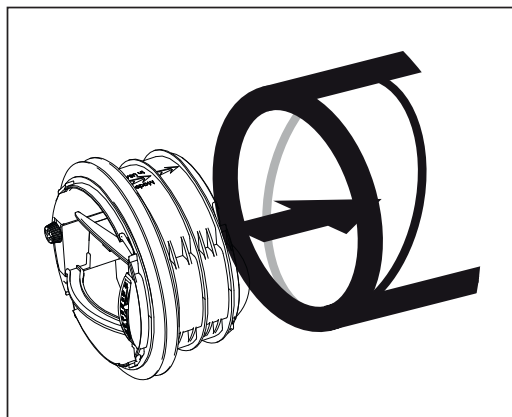
### 3. INSTALLATION



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

©2021 American ALDES Ventilation Corporation and ©2021 ALDES Canada. Reproduction or distribution, in whole or in part, of this document, in any form or by any means, without the express written consent of American ALDES Ventilation Corporation, is strictly prohibited. The information contained within this document is subject to change without prior written notice.

Aldes North America

USA 800.255.7749 • CAN 800.262.0916 • [www.aldes-na.com](http://www.aldes-na.com)

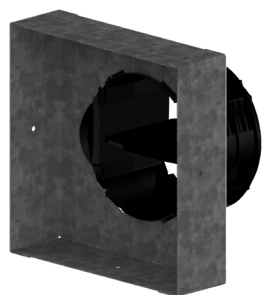
 **aldes**  
[www.aldes-na.com](http://www.aldes-na.com)



CAR3 IOM\_USA\_0721

## MODEL CONFIGURATIONS

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



CAR3-S



CER3-S



ZRT®





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

