

## Airflow Application Guidelines

ActronAir Advance systems are designed with a self-learning function to sense the installation zoning of a system to deliver the required balanced airflow. The following are some recommendations to make this system work to its optimum design.

### Duct Static Pressure

The ideal system design is for a duct with a TI Static pressure of 125Pa. This design static for the VAF (variable air flow) system allows for the optimal combination for duct sizing and energy efficiency of the system. This compares with 150 to 250 Pa for standard systems.

### Final and Return Air Duct Sizes

There are set parameters for sizing and design of both final duct (from the last take off to the outlet) and return air duct and fittings. The following duct sizes are based on a maximum final duct air velocity of 3 m/s and a maximum return air velocity of 4 m/s.

Other Recommendations are:

- Main duct velocity is recommended to be within 6-7 m/s.
- Branch duct velocity is recommended to be within 4-6 m/s.

Model	Nominal Supply Air Flow (L/s)	Minimum Supply Air Flow (L/s)	Minimum Final Air Duct Sizes	Return Air Duct Sizes
EVV140S / EFV140S	630	220	1 x 300 or 2 x 200	2 x 350
EVV160S / EFV160S	750	250	1 x 300 or 2 x 200	2 x 400
EVV180S / EFV180S	850	300	1 x 300 or 2 x 200	2 x 400
EVV210S / EFV210S	1020	350	1 x 350 or 2 x 250	2 x 450
EVV240S / EFV240S	1130	400	2 x 250	2 x 450

#### NOTE

Above values are designed to minimize noise generation at supply air outlet.

To reduce noise issues at the supply air grilles careful consideration must be taken when designing for minimum air quantity. (See above table) e.g. an EVV180S / EFV180S has a minimum supply air quantity of 300 l/s, this is too much airflow for 1 x outlet to handle and in this instance 2 x outlets correctly sized is recommended.

- On minimum zone selection two outlets should be considered for airflow and noise purpose.
- Systems larger than 13kw it is recommended to have 2 x outlets or more for minimum zones.

When an air balance is carried out, it is recommended that the airflow is adjusted at the branch take off points to each outlet is recommended instead of balancing dampers at the supply air outlet. This will also reduce noise at the supply air outlet/grille and eliminate any excessive static pressure.

#### NOTE

Supply and Return Air Plenums must be as per ActronAir Plenums or equal to, or lower static pressure.

## Return Air Grille Sizes

Careful consideration is to be given to pressure drops through return air grilles, air filters and crimped or tight bends in duct. Grille sizes shown are based on a velocity of 2.5 m/s, sizes shown are free area, please ensure your suppliers are aware of these requirements.

Model	Nominal Supply Air Flow (L/s)	Minimum Return Air Grille Sizes (free area)	Maximum Supply Air Flow (L/s)	Minimum Return Air Grille Sizes (free area)	Recommended Return Air Grilles (For nominal air flow)
EVV140S / EFV140S	630	0.26 m <sup>2</sup>	900	0.36 m <sup>2</sup>	540 x 640 = 0.35 m <sup>2</sup>
EVV160S / EFV160S	750	0.30m <sup>2</sup>	900	0.36m <sup>2</sup>	540 x 740 = 0.40m <sup>2</sup>
EVV180S / EFV180S	850	0.36m <sup>2</sup>	1020	0.41m <sup>2</sup>	540 x 890 = 0.48m <sup>2</sup>
EVV210S / EFV210S	1020	0.40m <sup>2</sup>	1200	0.48m <sup>2</sup>	540 x 890 = 0.48m <sup>2</sup>
EVV240S / EFV240S	1130	0.44m <sup>2</sup>	1320	0.53m <sup>2</sup>	540 x 890 = 0.48m <sup>2</sup>

### NOTE

To achieve maximum airflow you may need to upsize your return air grille one size larger than our 'Recommended Return Air Grilles' shown above.

Care must be taken to identify return air paths for each zone for minimal static. This may include undercut doors or additional return air duct and grilles.

## Other Guidelines

- Larger master bedrooms or parents retreats may have privacy issues with undercut doors, so a separate return duct or transfer duct may be needed. The use of walk in robes for positioning of return air grilles allows for a better finish.
- Special attention may also be required in home theaters where rooms are sealed for noise breakout. A dedicated return air duct with zone barrel linked to the supply air zone barrel may be required in this case.
- Small critical areas such as a study, which are below the minimum air flow and duct sizing, would need to be coupled with another area.
- Dual Master controllers are also recommended for two storey homes or larger single storey homes.

## Variable Airflow Test

### NOTES

- Test to be completed on zoned systems after commissioning of the fan is completed.
  - Zone 1 has been used as an example. Applications where the system has been designed to cool only selected zones at any one time, airflow may differ. For these applications complete test on a zone selected during the fan commissioning process.
1. Open all available zones and select **AUTO** fan mode on the wall control.
  2. Allow 3 minutes for fan to adjust speed.
  3. Check airflow at any outlet from Zone 1.
  4. Close all zones except Zone 1.
  5. Allow 3 minutes for fan to adjust speed.
  6. Check airflow at the same outlet.
  7. The airflow at this outlet should remain reasonably constant.
  8. Switch to the manual mode **HIGH**.
  9. A significant increase in airflow should be noted.
  10. Switch to medium, then low and note airflow drops accordingly.