BY JOHNSON CONTROLS

SOLUTION® AIR-HANDLING UNITS
DUAL FAN OPTIONS

APPLICATION GUIDE	New Release	Form: 102.20-AG17 (308)

INTRODUCTION

Dual fan options are now available for the Solution® product. The options offer more freedom in air-handling design increasing the flexibility of a customized system, while still realizing the many cost advantages of a factory assembled package.

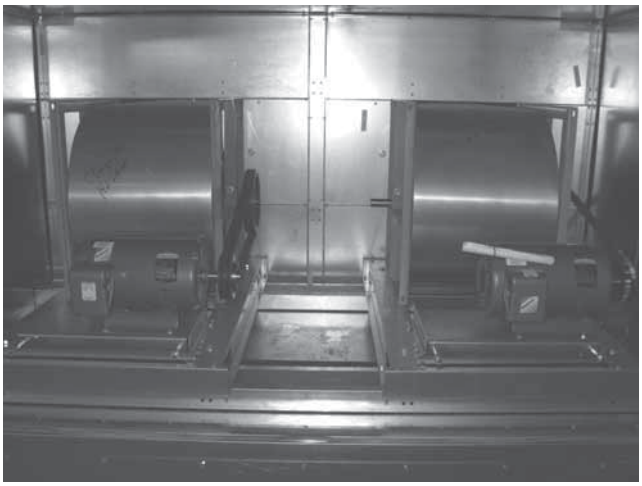
The Solution® dual fan segment is the key component designed to meet two primary needs:

- Fan Redundancy and
- Low-profile Unit Configuration

The dual fan segment is available with a variety of motor control options which can be tied directly into a building automation system to guarantee the reliability of redundant air application. Numerous housed and plenum centrifugal fans are available to meet airflow, energy-efficiency and acoustical requirements. Standard EPAct efficient or premium efficient motors can also be specified.

FEATURES AND BENEFITS

These new dual fan segments consist of two parallel placed fans, fan motors, a separation wall and a means



of air flow isolation. The features and benefits of using this option are listed in the table below:

SELECTION SOFTWARE

The option is supported by YorkWorks™ Solution® selection program. Both indoor and outdoor air handling units include this specific option. The program will allow you to select a dual fan option for Supply/Return and/or Exhaust fan segments within a given configuration.

FEATURES	BENEFITS
Fans placed in parallel	• High efficiencies across wide variations in system demand • Safety requirement in hazardous work environments where ventilation and indoor air quality are critical to worker safety. • Redundancy to mitigate the risk of downtime due to failure or unexpected maintenance. The existence of backup fans can help avoid production stoppage. • Footprints and weight are less per CFM in many cases
Access door for each motor is standard	• Meets servicing safety requirements
Separation wall	• A separation wall is available between the two fans for servicing safety
Flow Isolation Options: Sliding panel or damper	• Prevents air of an energized fan from going back through a fan that is not energized.
Improved Fan and Motor Control screens in Yorkworks	• Selection screens are user friendly for more precise ordering.

The motor control options contain more descriptions and details to ensure that components ordered will match equipment needs. See page 4 for more information concerning motor control selection options.

APPLICATION METHODS

The following two methods of applying the dual fan option will need to be considered.

50/50 Application

This is where both fans operate together to share the load equally. In a 50/50 application, the failure of one fan will result in a condition where the other fan will continue to operate. The single fan will provide partial load capabilities until the other is serviced.

100/100 Application

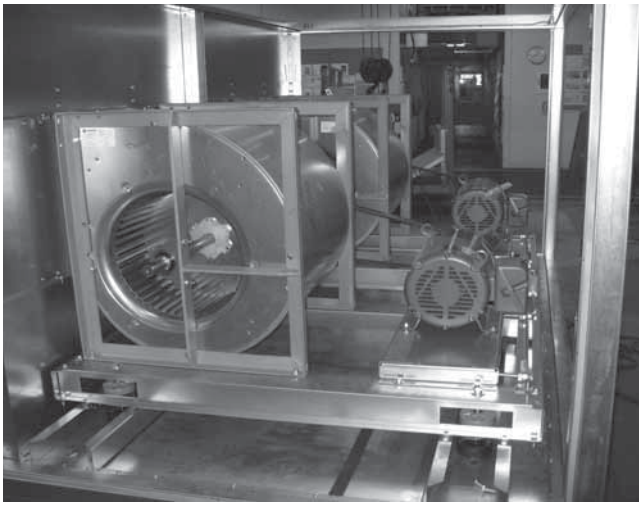
In a 100/100 application, the failure of one fan will result in the operation of the other (standby) fan to provide full capacity. Only one fan at a time is in operation.

FAN SEGMENTS & TYPES AVAILABLE

The Solution® dual fan segment houses a number of fan types. The dual fan segment is configured in one of two following ways - DWDI (double width, double inlet) and SWSI (single width, single inlet). Each configuration has its own selection of fan types.

Fan DWDI

In this configuration, the fan motor is mounted behind the fan. See photo below.



The types of fan allowable for this dual fan configuration are as follows:

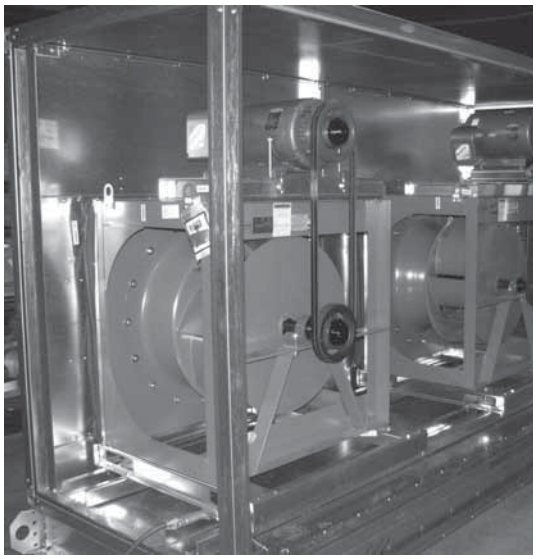
- Forward Curve (FC) fans 7" – 22"
- Standard Airfoil (AF) 12" – 22"
- Industrial Airfoil (AF) 12" – 22"
- Class I, II

Fan SWSI

In this configuration, the fan motor mounting location is as follows:

- Standard or Industrial Airfoil Plenum (PL)
  - 10” to 16” – BEHIND
  - 18” to 30” –TOP

See photo below for typical top motor mounting.



NOTE: Thrust restraint is factory provided for fans with top motor mounting.

The types of fans available for this dual fan configuration are shown below:

- Standard Airfoil (AF) 10” – 30”
- *Industrial Airfoil (AF) 12” – 30”
- Class I, II, *III

Access Doors

Both segment configurations will be provided with an access door on each side for fan/motor serviceability.

NOTE: Allow sufficient access to and clearance around the segment for fan motor removal from either side.

SERVICING SAFEGUARDS

If service to or maintenance of a dual fan segment is required while unit is in operation, it is imperative that the service personnel be protected against contact with any moving components of the functioning fan.

This can be accomplished by an optional built-in separation wall and other air flow isolation options.

NOTE: The safeguards need not be located at the point of operation, but only designed to prevent the employees from coming in contact with the point of operation.

Optional Separation Wall

An optional separation wall can be positioned between the failed fan and the functioning fan. This wall offers a nominal sheltering to allow service work to be performed in a safer manner.

Air Flow Isolation Options

The parallel fans in a dual fan application should have some form of air flow isolation to prevent the air from an energized fan from going back through a fan that is not energized.

Solution® dual fans, operating in parallel, are designed to offer elective forms of isolation or "block-off" capability to prevent recirculation of air through an idle fan.

Recirculation through an idle fan is not good for the fan, the motor, the system or the service personnel's working environment. The air flow isolation options serve to reduce the distress during start-up of bringing a revolving fan to a stop and then up to speed again.

The types of air flow isolation offered will vary with the type of fan selected. Figures 1 and 2 illustrate the various air flow isolation options that are available for dual fans.

NOTE: Only one option can be selected.

For SWSI fans – The isolation options available are as follows:

- Back-draft counter balance damper
- Mechanical control damper
- Built-in manual sliding block-off panel (patent pending)
- None (Field-Provided Isolation)

These options would mount on the inlet side of the SWSI dual fan segment.

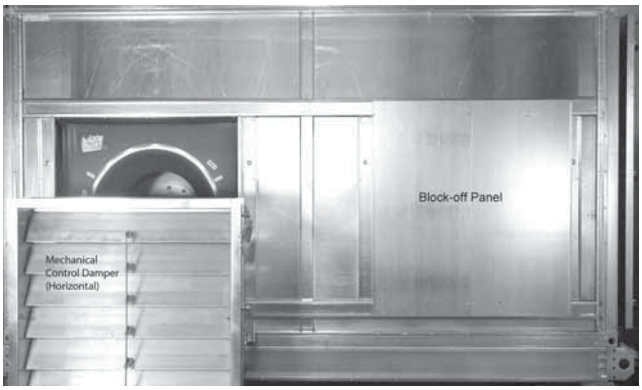


Figure 1 – SWSI dual fan segment (Inlet side shown)

For DWDI fans – The isolation options available are as follows:

- Mechanical control damper
- Built-in manual sliding block-off panel

These options would mount on the outlet side of the DWDI dual fan segment.

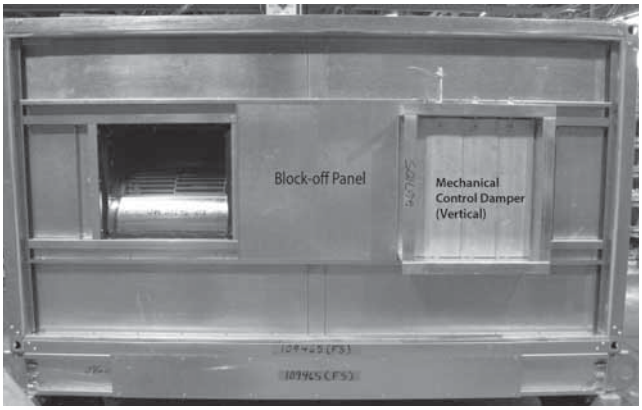


Figure 2 – DWDI dual fan segment (Outlet side shown)

NOTE: The sliding block-off panel is the most cost effective; however, an actuator controlled damper would provide an automated solution to your mechanical motion needs.

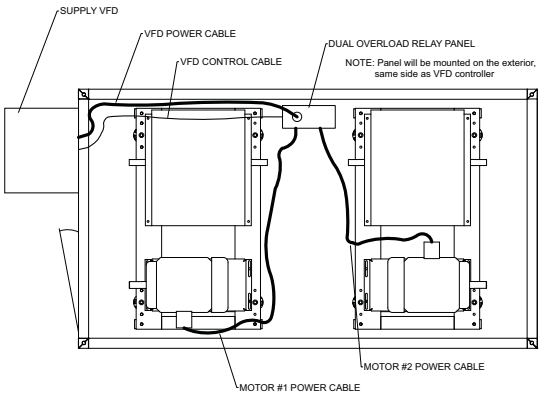
MOTOR CONTROL OPTIONS

The dual fan option gives you four different fan motor control configurations to choose from, see below.

Option #1 – AirMod VFD – Single controller with switching capability

Single VFD with a switching control panel installed and wired between the VFD output and the fan motors. The panel will contain terminal blocks, sized for the total load, Hand Off Auto switches, and all the necessary changeover contactors and overloads, size based on the HP and Voltage of the fan motor.

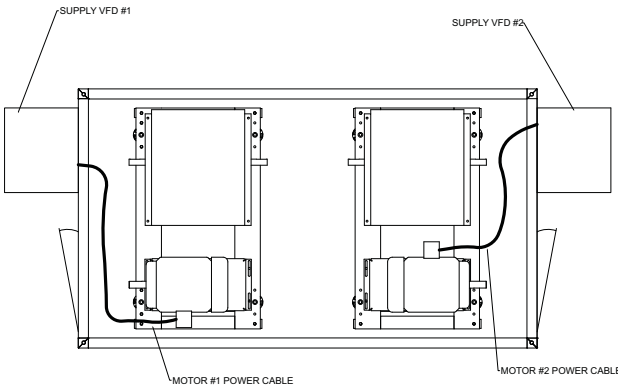
- *If dual fan has single controller application, then motor controller will be mounted on primary side (unit hand) access door.*



Option # 2 – AirMod VFD – Separate controllers

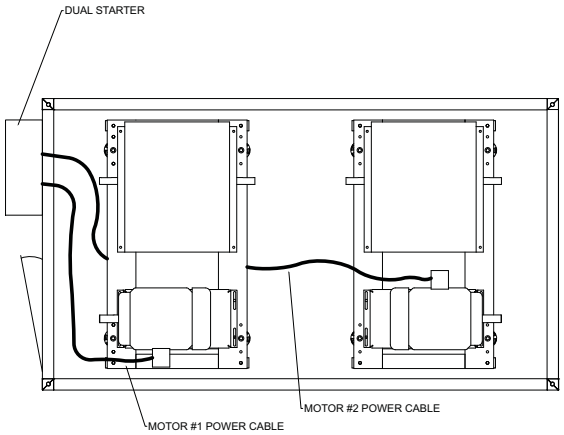
A separate VFD will be sized for each motor which will be of identical HP rating.

- *If dual fan has separate controllers, then one controller will be mounted on each side of the fan segment.*



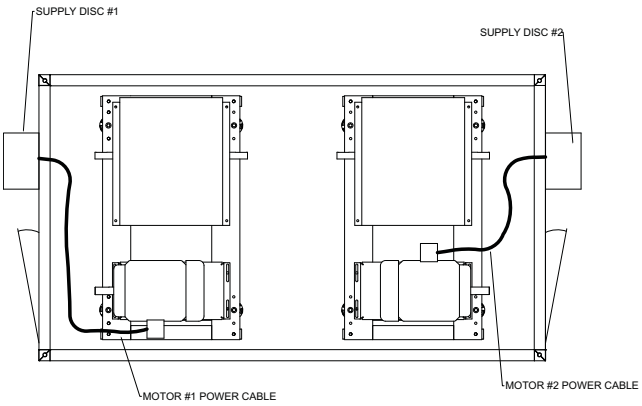
Option # 3 – Across the line starter – Single controller

Starter panel will be sized for the control of both motors eliminating the need for two separate panels. The panel will have individual hands-off auto-switches for each starter circuit with manual jumpers to configure the fan application.



Option # 4 – External Wired Disconnect – Separate Switches

Each motor will be equipped with a separate disconnect switch.



Supersedes: Nothing