Blower Door Fan comparison

Includes specifications and information commonly available from public sources.

The Energy Conservatory (TEC)

Model BD-3 120 Volts

The TEC blower door fan has Ring A, B, C, D & E flow plates that clip on with clips that rotate to hold the plates on. Flow Plates are vacuum formed.

Model BD-3

Retrotec (Rt)

Model 5000 120 Volts

The Retrotec blower door fan has a Ring A flow plates that hooks on and a Ring B8 Plate that is held on with super magnets as seen on the right. Eight Flow Plugs snap into the B8 for lower flows. Flow Plates are all injection molded.

Model 5000

Retrotec (Rt)

Model 6000 120 Volts

Same flow plates for 6000. Notice the Variable Frequency drive in the lower right that runs the motor and is controlled by the gauge or the knob on the drive.

Model 6000

Fiber reinforced 2 piece injection molding held together with 4 rivets on flange

Flexible homogenous 2 piece injection molding held together with 7 rivets on flange.

Triac circuit for speed control on power cord. Manual speed control attached to power cord.

Regulated steady speed control inside fan produces better control with less overheating. Can be controlled over 100 meters using CAT 5 cable.

Variable Frequency Drive adjusts fan speed faster and maintains a constant speed under all loads.

How do the Fans compare?

Model BD-3and 5000 both use a similar synchronous motor that is slowed down by wind or small voltage variations. The Model 6000 is unaffected by wind and voltage so it does not lose power. Other advantages are that the motor does not overheat, it has a wider flow range allowing a test to be completed without changing ranges and because it is powered by a Variable Frequency Drive, it does not vary in speed when the load increases due to wind or the voltage decreases. The extra power enables applications such as rain penetration testing.

Model BD-3	Model 5000	Model 6000
Released in 1991	Released in 2015	Released in 2015
	Maximum Flow at 60Hz:	
5350 CFM at 50Pa 4900 CFM at 75Pa	5700 CFM at 50Pa 5400 CFM at 75Pa	7700 CFM at 50Pa 7400 CFM at 75Pa
	Minimum Flow:	
11 CFM	111 CFM	95 CFM
	9.1 CFM Optional extra	9.1 CFM Optional extra
	Dimensions:	
• 33 lb with Ring A, B, C, D & E • Fan Inlet Diameter: 19.7 inches • Fan Depth: 10.2 inches • Fan blades: 6 x 45 degree pitch	• 34 lb with Ring A&B • Fan Inlet Diameter: 22 inches • Fan Depth: 10.2 inches • Fan blades: 8 x 35 degree pitch	• 35 lb with Ring A&B • Fan Inlet Diameter: 22 inches • Fan Depth: 10.2 inches • Fan blades:8 x 40 degree pitch

** Flow will vary depending on the following factors: voltage, frequency, barometric pressure, backpressure, blade pitch, air temperature, bearing tightness, inlet air turbulence*

Who uses Retrotec?

The BD-3and Model 5000 are fairly evenly divided for worldwide sales. The Model 5000 was released in 2015 and has already begun to swing buyers in its favor. Features such as wider flow range, ISO Calibration availability, faster range selection, superior software and more advanced gauge make it the overwhelming choice.

The Model 6000 and previous model 3000 are used in over 85% of the large building tests worldwide. Four companies with offices in the USA, BCRA, PIE Forensics, Morrison Hersefield and RDH have together performed over 2000 large building tests with Retrotec Fans. In the UK, BSRIA, NHB and Stroma have over 100 Retrotec Model 3000s between them and perform most of the tests in the UK which is the only country to have mandatory large building tests. Model 5000 or BD-3 for large buildings are seldom used because:

- flow rates are lower forcing many more fans to be installed to complete a test
- flow ranges are narrower which forces ranges to be changed during the test
- Wind will cause the fans to speed up and slow down making results less repeatable

Comparison of Retrotec to Minneapolis blower door fan flow rates

This is just one dataset from a random sample of a Minneapolis and a Retrotec 3000SR Blower Door Fans. Both were compared to Retrotec's orifice plate calibration chamber and tested at a constant back pressure of 50 Pa over a roughly similar flow range. Flows were compared to the reference orifice plate flow which is measured according to ASTM E1258.

Minneapolis Blower Door (using published curves) – up to 100% speed

Total orifice area (in^2)	Orifice pressure (Pa)	Chamber flow (cfm)	Back pressure (Pa)	Fan pressure (Pa)	Fan flow (cfm)	% Error
472.8	**49.8**	**3596**	**50**	**58.9**	**3702**	**3.0%**
472.8	**64.7**	**4097**	**50.1**	**76**	**4193**	**2.3%**
472.8	**89.8**	**4825**	**47.8**	**110.5**	**5033**	**4.3%**
472.8	**98.7**	**5058**	**51.3**	**119**	**5218**	**3.2%**
472.8	**107**	**5266**	**48.9**	**129**	**5427**	**3.1%**

Retrotec Blower Door (using Round *C1* published flow equation parameters) – up to 70% speed

Total orifice area (in^2)	Orifice pressure (Pa)	Chamber flow (cfm)	Back pressure (Pa)	Fan pressure (Pa)	Fan flow (cfm)	% Error
525.8	**49.8**	**3999**	**50.2**	**46.3**	**3909**	**-2.3%**
525.8	**59.9**	**4385**	**50.1**	**55.9**	**4311**	**-1.7%**
525.8	**73.5**	**4856**	**50.2**	**67.2**	**4744**	**-2.3%**
525.8	**89.7**	**5363**	**49.9**	**84.3**	**5338**	**-0.5%**
525.8	**109**	**5911**	**50**	**101.2**	**5870**	**-0.7%**

Conclusion

The Retrotec Fan appears to be within ±2.3% while the Minneapolis Fan is within ±4.3%. It should be taken into account that ASTM E1258 Chambers accuracy is in the range of ±3% and this is only two samples so this is not a comprehensive evaluation.