

High Air Flow and High Static Pressure Blower “San Ace B120” BFB Type

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1. Introduction

As communication equipment and information processing equipment become higher performance and higher speed, the insides of the equipment become higher heat and higher density. Therefore, cooling fans with high air flow and high static pressure are required.

Sanyo Denki developed a 120 mm sq., 32 mm thick size high air flow and high static pressure blower with greatly improved performance compared to our conventional model.

This document introduces the features and performance of the “San Ace B120” BFB type fan.

2. Background of the Development

120 mm sq., 32 mm thick blowers are primarily used in information communications related equipment and similar types of equipment. Sanyo Denki has previously developed and started sales of the 109BF series blower of the same size. However, as equipment becomes higher performance and higher speed, demand has come for a built-in blower model with high performance. Furthermore, devices are rapidly lowering power consumption to help prevent global warming, and therefore demand has also come for lower power consumption. There were some cases where the performance of our conventional model could not satisfy these demands.

Needing to meet these market needs, Sanyo Denki developed the 120 mm sq., 32 mm thick high air flow and high static pressure blower “San Ace B120” BFB type with greater cooling performance and power consumption compared with our conventional model.

3. Product Features

Fig. 1 shows the appearance of the “San Ace B120” BFB type.



Fig. 1: “San Ace B120” BFB type

The features of this product are as follows.

- (1) High air flow and high static pressure
- (2) Low power consumption
- (3) PWM control function

The “San Ace B120” BFB type (hereinafter referred to as the new model) has maximum air flow increased 2.1 times and maximum static pressure increased 7.1 times compared with our conventional 120 mm sq., 32 mm thick blower 109BF type and it achieved the lowest power consumption in same size blower. The new model can also control the fan speed with PWM controls.

4. Product Overview

4.1 Dimensions

Fig. 2 shows the dimensions of the new model.

4.2 Characteristics

4.2.1 General characteristics

There are two models with 12 VDC and 24 VDC rated voltage, and both models have a rated speed of H speed (3750 min^{-1}).

Table 1 shows the general characteristics for the new model.

4.2.2 Air flow vs. static pressure characteristics

Fig. 3 shows the air flow versus static pressure characteristics for the new model (24 VDC).

4.2.3 PWM control function

Fig. 4 shows PWM duty cycle versus speed for the new model (24 VDC).

4.3 Expected life

The new model has expected life of 40,000 hours at 60°C (survival rate of 90% with continuous operation at the rated voltage under free air condition and at normal humidity).

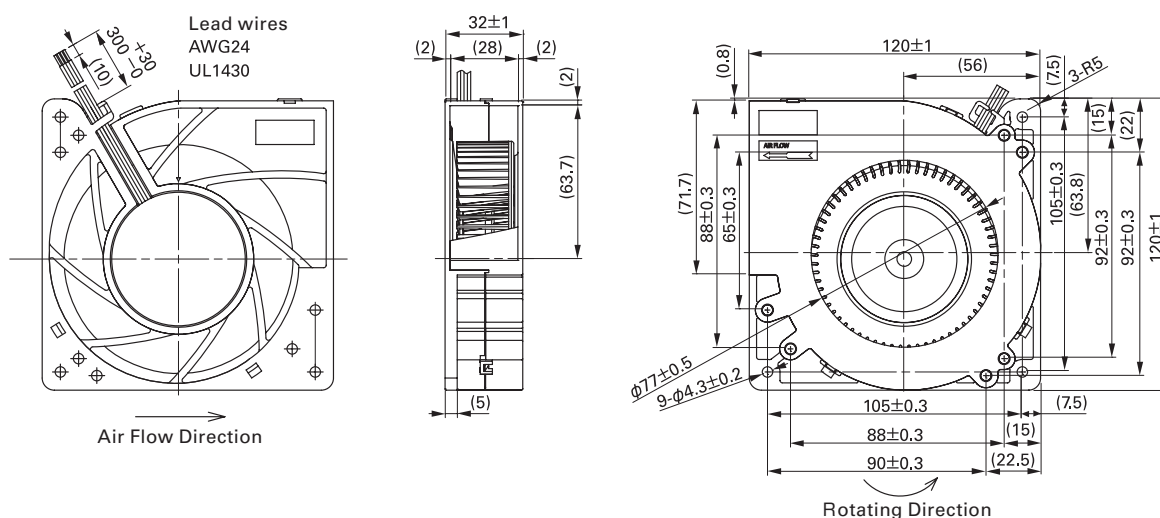


Fig. 2: "San Ace B120" BFB type dimensions (unit: mm)

Table 1: "San Ace B120" BFB type general characteristics

Model No.	Rated voltage [V]	Operating voltage [V]	PWM duty cycle (Note 1, 2) [%]	Rated current [A]	Rated input [W]	Rated speed [min^{-1}]	Max. air flow [m^3/min] [CFM]		Max. static pressure [Pa] [inchH ₂ O]		Sound pressure level [dB(A)]	Operating temperature [$^\circ\text{C}$]	Expected life [h]
9BFB12P2H003	12	10.8 to 13.2	100	2.3	27.6	3,750	1.6	56.5	1,250	5.02	62	-20 to +70	40,000
9BFB24P2H003	24	21.6 to 26.4	100	1.1	26.4	3,750	1.6	56.5	1,250	5.02	62		
			0	0.12	2.88	1,300	0.46	16.2	43	0.17	41		

Note 1: Input PWM frequency: 25 kHz

Note 2: When the PWM duty cycle for 9BFB12P2H003 is 0%, speed is 0 min^{-1} .

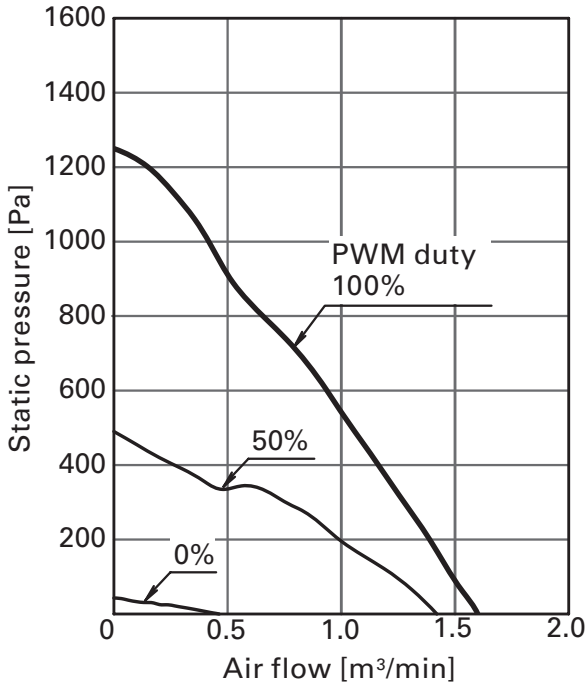


Fig. 3: Air flow - static pressure characteristics for 9BFB24P2H003

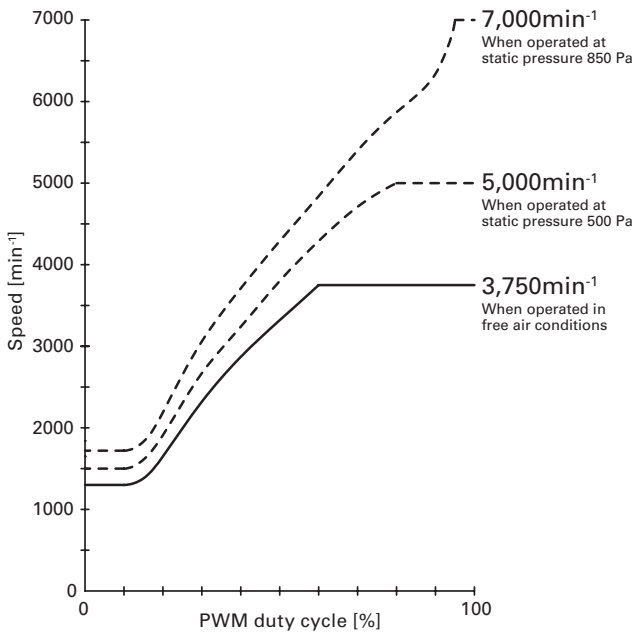


Fig. 4: 9BFB24P2H003 PWM duty cycle - speed characteristics

5. Comparison with Our Conventional Product

The impeller, frame, and motor of the new model were newly designed to greatly improve the performance over our conventional model of the same size (109BF type).

In order to achieve high static pressure and low power consumption in the new model, the design for the motor, impeller, and frame were optimized, which made it possible to develop a product that has excellent air flow versus static pressure characteristics, power, and SPL (sound pressure level).

The following information introduces the differences between the new model and our conventional model.

5.1 High air flow and high static pressure

Fig. 5 shows the air flow versus static pressure characteristics between our conventional high performance model and the new model. The new model (9BFB24P2H003) increased air flow approximately 2.1 times and static pressure approximately 7.1 times compared with our conventional model (109BF24HA2).

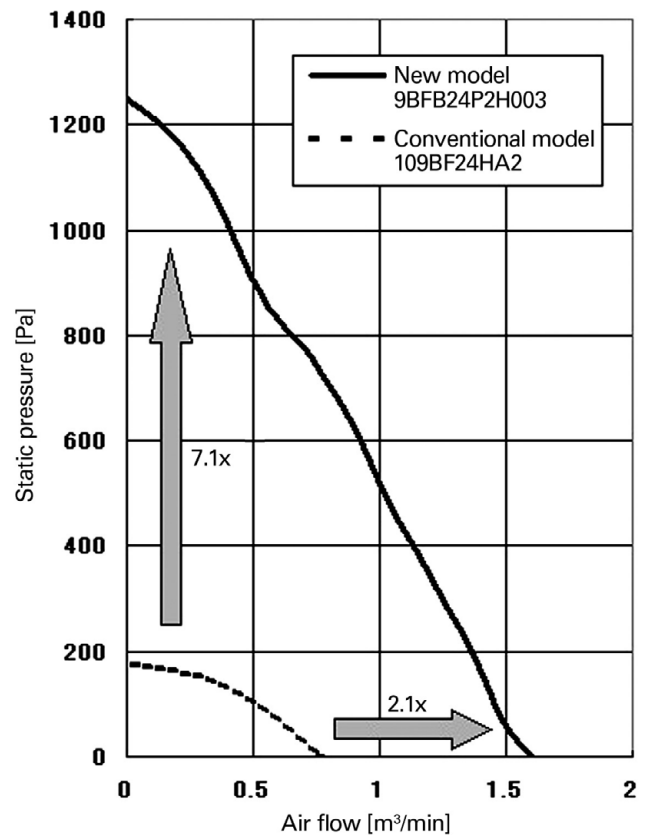


Fig. 5: Comparison of air flow - static pressure characteristics

5.2 Low power consumption and low SPL

Fig. 6 shows the air flow versus static pressure characteristics when new model and conventional model are same cooling performance.

As shown in Fig. 7, when both new model and conventional model are run in free air condition, the new model lowers power by 38% and sound pressure level by 5 dB (A) compared with our conventional model.

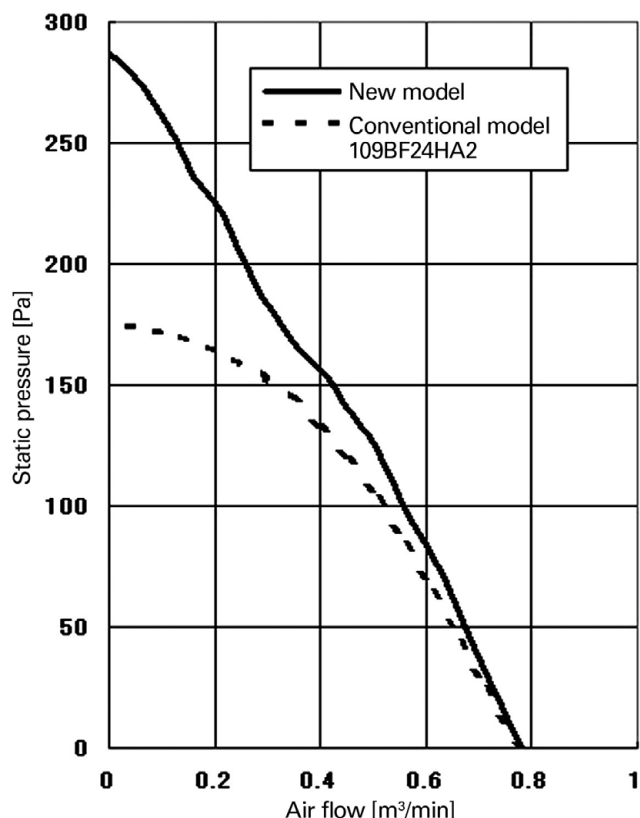


Fig. 6: Comparison of air flow - static pressure characteristics (At same maximum air flow)

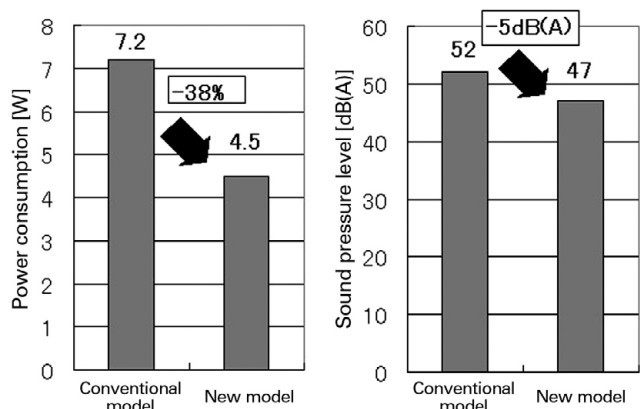


Fig. 7: Comparison of power consumption and sound pressure level (At same maximum air flow)

6. Conclusion

This document introduced some of the features and advantages of the "San Ace B120" BFB type fan.

The new model achieves dramatically higher air flow compared with our conventional model (109BF24HA2). Furthermore, the newly developed motor control method achieves much higher static pressure, this model becomes top-class product in the market.

This product is sure to contribute to a variety of applications including information communications related equipment and OA equipment with high heat generation and high component density.

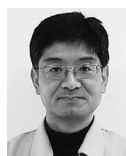
Documentation

- (1) Naoki Murakami and others: High Air Flow and High Static Pressure Blower "San Ace B97" BMB Type
SANYO DENKI Technical Report, No. 27 (2009-5)



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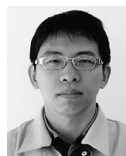
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