“San Ace 150” GV Type

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1. Introduction

With increases in both packaging density and heat generation in the server and communications equipment markets, there is a strong demand for compact and small-footprint fan motors with higher air flow and static pressure.

Our company therefore developed a “first-in-the-industry” 150 mm square × 50 mm thick fan.

This document introduces the functions and features of the “San Ace 150” GV type fan that we have developed.

2. Development Background

Our company has a history of developing and selling 172 mm diameter × 51 mm thick fans. However, market demand for smaller footprint and higher air flow has grown stronger recently and current products may not always meet this demand.

In response to the state of the market, we developed the new “San Ace 150” GV type series.

3. Product Features

Fig. 1 shows the exterior view of the “San Ace 150” GV type fan.

The features of this product are as follows:

(1) High air flow and high static pressure

(2) Light weight

The “San Ace 150” GV type fan uses a new design for both frame and blades to achieve increased air flow, increased static pressure, and lighter weight.

Fig. 1: Exterior view of the “San Ace 150” GV type fan

4. Product Overview

4.1 Dimensions

Fig. 2 shows the dimensions of the “San Ace 150” GV type fan.

4.2 Characteristics

4.2.1 General characteristics

The rated voltage is 12 V DC and the rated rotating speed is 3900 min^{-1} and 3000 min^{-1}.

Table 1 shows the general characteristics of the “San Ace 150” GV type fan.

4.2.2 Air flow vs. static pressure characteristics

Fig. 3 shows the air flow versus static pressure characteristics of the “San Ace 150” GV type fan.

4.3 Expected life

The “San Ace 150” GV type fans have an expected life of 40,000 hours at 60°C (survival rate of 90% with continuous operation at the rated voltage under free air conditions and at normal humidity).

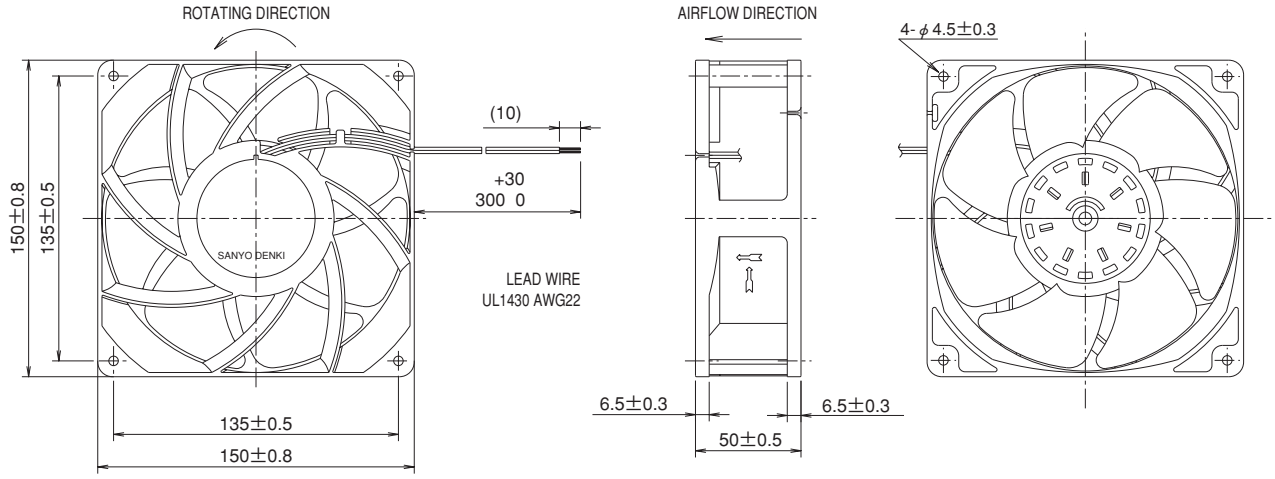

Fig. 2: Dimensions of the "San Ace 150" GV type fan

Table 1: General specifications of the "San Ace 150" GV type fan

Model No.	Rated voltage (V)	Operating voltage range (V)	Rated current (A)	Rated power (W)	Rated rotating speed (min^{-1})	Maximum air flow (m^3/min)	Maximum air flow (CFM)	Maximum static pressure (Pa)	Sound pressure level (dB [A])	Mass (g)
9GV1512H502 (5021)	12	10.2-13.8	2.9	34.8	3900	8.54	300	210	61	450
9GV1512M502 (5021)			1.2	14.4	3000	6.35	224	132	53	

Model numbers for ribless fans are shown in parentheses.

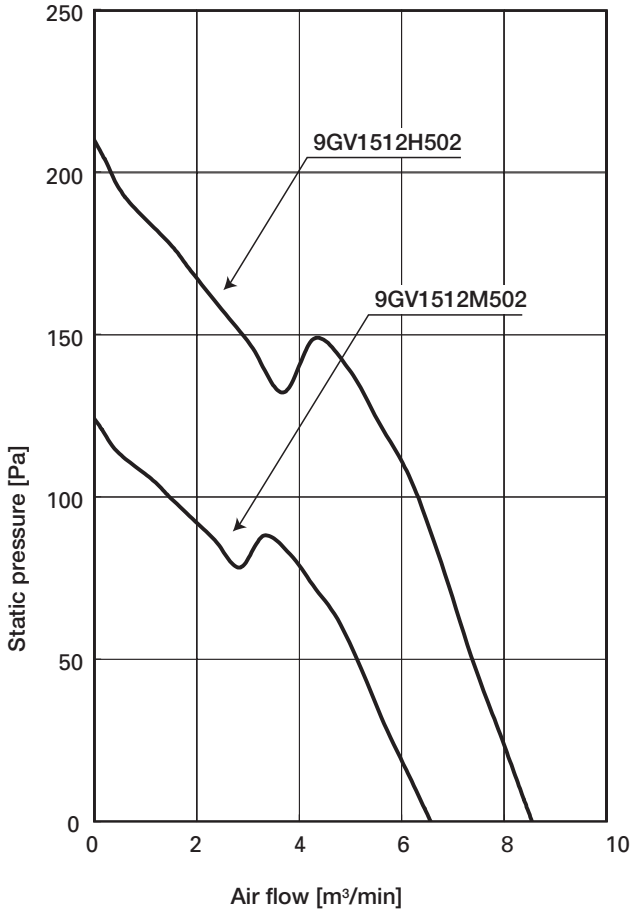

Fig. 3: Air flow vs. static pressure characteristics

5. Comparisons with Conventional Products

With this product, we have succeeded in reducing the fan size by increasing the air flow efficiency through advances in frame and fan blade shape while maintaining the air flow and static pressure characteristics of the conventional 172 mm diameter × 51 mm thick fans.

The following section describes the differences between the "San Ace 150" GV type fan and the conventional products.

5.1 Characteristics comparison

Table 2 and Fig. 4 show the differences in characteristics between the "San Ace 150" GV type fan and a conventional product.

During this development, we used 3D CAD modeling and rapid prototyping to design a frame and fan blades that maximize air flow and static pressure. For example, if a system impedance is assumed as shown in Fig. 4, the air flow of the conventional product at operating point A is 4 m^3/min, while the "San Ace 150" GV type fan has an air flow of 4.6 m^3/min at operating point B, a 15% increase in air flow.

Fig. 5 compares the weights of the two products.

By using resin for frame material, as shown in Fig. 5, we succeeded in reducing the product weight by 40% compared to a conventional product.

Table 2: Characteristics comparison of the "San Ace 150" GV type fan (9GV1512H502) with a conventional product

Model No.	Maximum air flow (m³/min)	(CFM)	Maximum static pressure (Pa)	Rated current (A)	Sound pressure level (dB [A])	Rated input (W)	Mass (g)
9GV1512H502	8.54	300	210	2.9	61	34.8	450
Conventional product	8.50	300	342	2.9	60	34.8	760

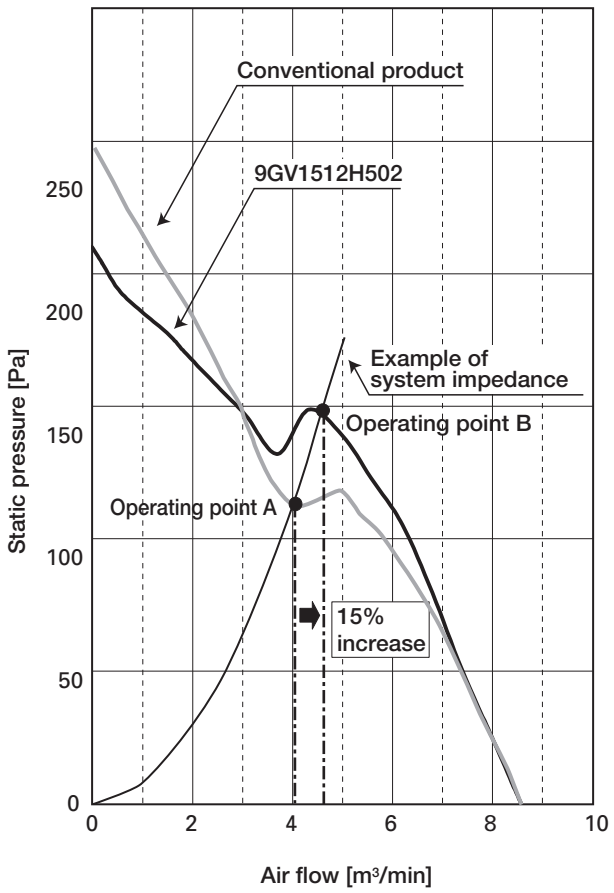

Fig. 4: Comparison of air flow vs. static pressure characteristics

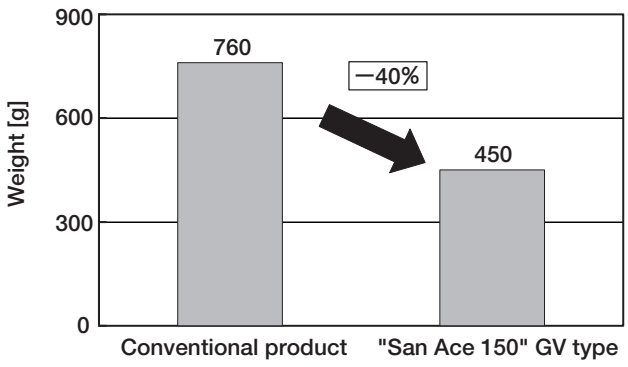

Fig. 5: Comparison of weights

6. Conclusion

In this document, we have introduced some of the functions and features of the new "San Ace 150" GV type fan.

When compared to our conventional products, this new fan has higher air flow and lighter weight while also offering improvement in performance. As electronic devices generate more and more heat and as packing density increases for telecommunications and other devices, we feel that this new fan can contribute greatly as a cooling fan for these products.

This product offers reduced power consumption along with reduced size and weight as well as improved environmental impact. Because of its smaller environmental footprint, it has earned our ECO PRODUCTS mark (Fig. 6).

ECO PRODUCTS

Fig. 6: ECO PRODUCTS Symbol

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