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BLDC Fans – Advantages and Disadvantages

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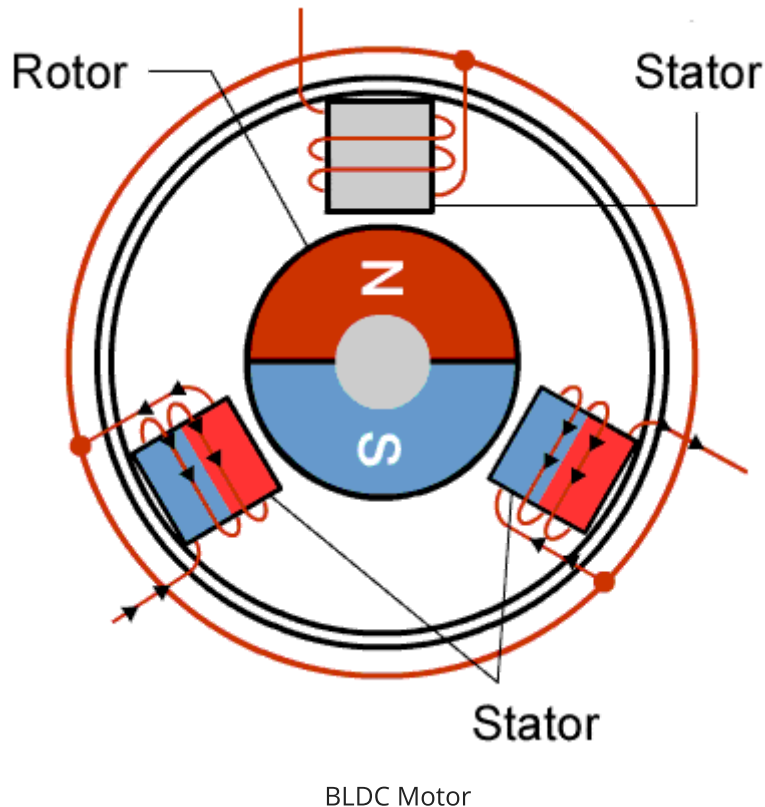
With the invention of LED bulbs, conventional incandescent bulbs have all but disappeared from the market. Today, you get LED tube lights also. As a result, few people purchase the traditional tube lights. The same could happen to the **ceiling fans** soon, with **BLDC fans becoming more popular**.

Let us briefly understand what a BLDC fan is and how it works. Then, we shall discuss the advantages and disadvantages of using BLDC fans.

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BLDC Fans – Brushless DC Motor Fans

Generally, the ceiling fans run on induction motors. However, BLDC fans use brushless direct current (BLDC) engines to lower power consumption by 65%.



BLDC fans last longer and do not get hot. The thickness of the copper cables ensures there are no frequent winding problems.

Related: [BLDC Fan vs Normal Fan](#)

BLDC Fans – Structure and Working Principle

The BLDC fan motor comprises three functional components, the stator, rotor, and shaft. It converts electrical energy into mechanical energy using a series of gears. BLDC fan drives

draw their power from SMPS (switched-mode power supplies).



The difference between the BLDC and a conventional motor is that BLDC uses permanent magnets instead of electromagnets used by traditional motors. As a result, it **converts AC into DC**, thus, enabling the motor to function at low voltages.

The BLDC motor does not have brushes between the stator and the rotor. Thus, it saves energy and does not become hot. These fans, also known as smart fans, have a BLDC circuit comprising the SMPS, microcontroller, inverter, and motor.

The SMPS converts AC to DC, whereas the microcontroller sends the incoming signal to the inverter, allowing the fan to rotate. The best aspect of BLDC technology is that you **can control these fans using your Android smartphones** and the internet.

We now know how BLDC fans work. So, let us understand its advantages and disadvantages to learn why this technology is poised to revolutionize the way we use ceiling fans today.

Related: **BLDC Motor vs Induction Motor**

Advantages of BLDC Fans



Superfan BLDC Fan

- ✓ **Fewer Maintenance Costs** – BLDC fans do not have carbon brushes between the stator and the rotor. Hence, there is no question of replacing the brushes and spending money on maintenance.
- ✓ **Better Performance** – BLDC fan motors are electronically controlled. Hence, it allows for greater speed regulation and motor torque. As a result, these ceiling fans deliver highly-efficient performances.
- ✓ **Long-lasting** – The absence of brushes eliminates the chances of generating sparks that could cause the motor to burn. Hence, BLDC motors last considerably longer than conventional fan motors.
- ✓ **Lesser Noise** – Generally, motors cause noise because of the friction caused by the brushes. There is zero friction in the case of BLDC motors, and hence, they produce less

noise than ceiling fans we generally use.

- ✓ **Less likelihood of failure** – BLDC motors work on an electronic control system compared to the mechanical commutation system used in the traditional ceiling fans. Hence, there are fewer chances of failure due to wear and tear.
- ✓ **Greater torque** – BLDC fans consistently deliver maximum torque to ensure high-quality performance than regular ceiling fans.
- ✓ **Better Efficiency** – The feedback control system allows easy monitoring and control of the torque and speed. It results in greater torque accuracy to ensure better efficiency, lower power consumption, and long-lasting lifespan.
- ✓ **Less heat generation** – The traditional fan motors have an electromagnet at the center. It causes the motor to become hot and does not cool down rapidly. On the other hand, BLDC fan motors do not have a magnet at the center, reducing the chances of overheating.

While BLDC fans have their advantages, we should know the demerits to make an informed decision when purchasing them for our homes.

Disadvantages of BLDC fans



- ✘ **More expensive** – Compared to a brushed motor, the BLDC motor is more costly. The setup includes an electronic controller, whereas the regular ceiling fan motor employs a low-cost mechanical commutation arrangement.
- ✘ **Vibrations at lower speeds** – The BLDC fan motor produces small vibrations at low rates. While it is expected, the vibrations reduce as the fan speeds up. This vibration at low speeds can result in a resonance phenomenon. However, one can adjust the device and reduce its vibration to the minimum.
- ✘ **Installation challenges** – The presence of the electronic controller makes it complicated to install BLDC fans. You need an experienced technician to do so. However, it is not the case with regular ceiling fans because of their straightforward wiring process.

Related: [BLDC vs Normal Fan Power Consumption](#)

Which is the better choice – BLDC or Regular Ceiling Fan?

Regular ceiling fans work on a single-phase induction motor, whereas BLDC fans draw their power from an electronic DC motor. Therefore, BLDC fans consume 60% less energy compared to conventional fans. Besides, the motor is robust compared to its weight.

Thus, BLDC fans present a better energy-efficient option.

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