

MANUFACTURING

As a basic manufacturer of blower motors, The Four Seasons[®] manufacturing facility has the ability to identify known flaws and engineer/manufacture a solution. Extensive quality control ensures all engineering and quality requirements are met for a superior quality and cost-effective product. Four Seasons[®] is an ISO 14001 certified facility and has implemented a QOS (quality operating system) committed to continuous improvement of all business processes. Each unit is 100% tested for functional performance and operational noise before ever going out the door.

- ✓ Integrated cooling for motors and PWM controllers
- ✓ Self-contained and fully programmable PWM
- ✓ Hermetically sealed electronics
- ✓ Incorporated stall protection

- ✓ Reverse, over and under current and voltage protection
- ✓ Thermally protected electronics
- ✓ Long-life brushes and bearings
- ✓ Temperature tested to operate in -104°F to 176°F



COVERAGE

Four Seasons[®] is the Aftermarket leader with over 273M+ applications, including 54M+ of O.E.-matching brushless motor designs coverage, for domestic, import, hybrid / electric and medium duty applications.

BRUSHLESS BLOWER MOTORS

Did You Know? Brushless blower motors first appeared in the mid-1990s and have increased in popularity with O.E. manufacturers.

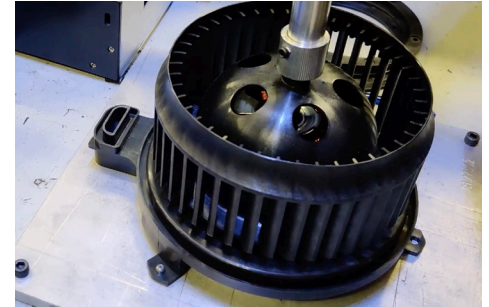
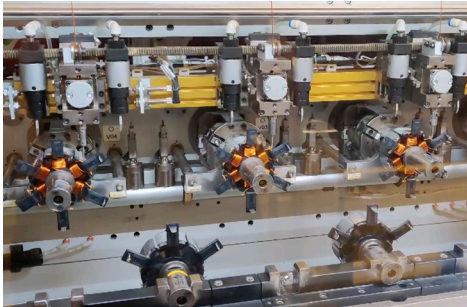
Brushless Direct Current (BLDC) motors utilize electronic sensorless commutation instead of brushes. The most common failure of the brushed design blower motor used for decades are the brushes themselves.

BLDC motors are more efficient by design. This design has characteristics such as quieter operation, greater speed control, increased efficiency, less weight and are usually smaller than their brushed counterparts.

- ✓ More speed control with less power demand
- ✓ Quiet operation
- ✓ Quick response to control changes
- ✓ Larger operating speed range
- ✓ Increased service life



THE BRUSHLESS ADVANTAGE



Brushless motors are generally more efficient than brushed motors because they have fewer moving parts and less friction. This leads to better performance and lower energy consumption, which is especially beneficial for the vehicle's overall power management.

Durability: Without brushes that wear out over time, brushless motors typically have a longer lifespan and require less maintenance. This reliability is crucial for automotive applications where durability is a key factor. All Four Seasons[®] motors are durability tested to strict quality standards for enhanced longevity and performance.

Noise and Vibration: Brushless motors operate more smoothly and quietly compared to brushed motors. This results in a quieter cabin environment, contributing to overall passenger comfort. Four Seasons[®] motors must meet all O.E. specifications for noise and rotational balance prior to approval by our engineering and production teams.

Performance: Brushless motors offer better torque control and can operate at higher speeds without losing efficiency. This translates to better performance in controlling the blower speed and airflow. Four Seasons[®] brushless motors are built and tested to O.E. performance specifications while other aftermarket motors lack crucial performance factors due to shortcuts taken to cut costs in manufacturing. These shortcuts lead to motors that do not match the speed, control and efficiency when compared to the O.E.

Electric vehicle brushless blower motors are not only used for cabin cooling but also battery cooling. Their efficiency helps maximize the range and performance of electric vehicles. Brushless motors may also be found in other automotive systems where precise and efficient motor control is needed, such as seat ventilation systems and some active aerodynamic components.

As automotive technology evolves, brushless blower motors are expected to become more prevalent due to their efficiency and reliability. Advances in motor control technology and integration with vehicle electronics will likely continue to enhance their performance and capabilities. Four Seasons[®], your complete HVAC source will continue to lead the aftermarket in motor applications for today's vehicles and the vehicles of the future.