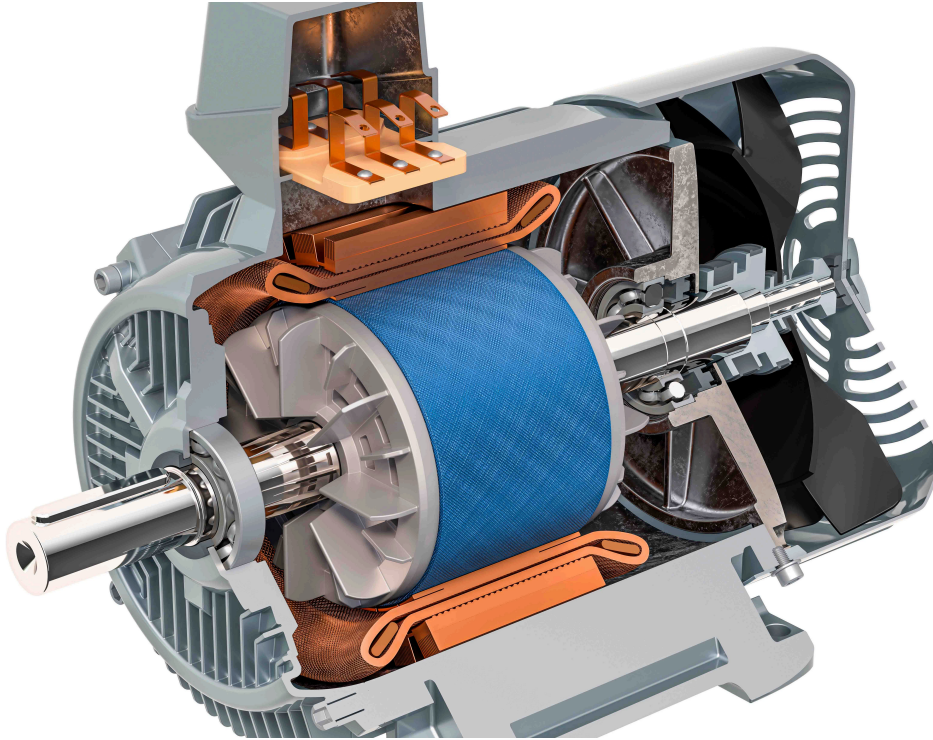


TECH OFFER

Compact And High-Power Motor Using Vector Control Technology



KEY INFORMATION

TECHNOLOGY CATEGORY:

Electronics - Actuators

Electronics - Power Management

TECHNOLOGY READINESS LEVEL (TRL): **TRL6**

COUNTRY: **SINGAPORE**

ID NUMBER: **TO174856**

OVERVIEW

The conventional DC brushless motors face the challenge of reduced output when their size is reduced to achieve a smaller product, as well as the difficulty of precise control according to the load. A unique solution to these problems would be the use of compact, high-power DC brushless motors with vector control technology. These current issues contributed to the product developers in the creation of more compact and lightweight products that offer improved performance and increased functionality by responding to load-specific characteristics. With vector control technology, these motors provide precise control over motor speed and torque, resulting in enhanced efficiency and reduced energy consumption. The benefits of using these motors include improved product design, increased functionality, and greater efficiency.

The technology offer comprises of two portions of the motor internal structural design and the use of vector control technology to maximize the performance of the overall system. These unique motors control system offers a reliable and effective solution to the challenges faced by conventional DC brushless motors.

The technology owner is keen to do R&D collaboration and licensing out the know-how to a variety of applications such as robotics, electric vehicles, and industrial automation systems.

TECHNOLOGY FEATURES & SPECIFICATIONS

The main features of the technology offer are:

1. Compact and lightweight:

- The motor's compactness and high-power output are achieved by improving the space factor using split iron core structure
- Ability to achieve about 40% reduction in physical size of motor while maintain the power output
- Weight of the motor can achieve reduction of about 25%
- Output power increased by upto 60% compared to the similar-sized motors

2. Precision drive control according to load fluctuations by vector control:

- The motor can be controlled to the optimum speed and torque according to the load by monitoring the motor load from the individual current values across the three phases.
- Optimum drive control can achieve 10% increase in working speed and 15% increase in workload

3. Environmental resistance performance: Waterproof and dustproof performance equivalent to IP56, making it suitable for machine tools and equipment used outdoors.

POTENTIAL APPLICATIONS

The technology offer can be customised and adopted in various application that uses compact brushless DC motors, such as:

- Personal Mobility:
 - Electric bicycles
 - Electric kickboards
 - Electric baby car
- Material Handling:
 - Automatic guided vehicles (AGV)
 - Electric power-assisted trolleys
- Personal and Commercial Automation:
 - Electric doors
 - Platform screen doors
 - Electric garage gates
 - Non-residential automatic doors
 - Electric reels for fishing
 - Automatic cleaning robots
 - Electric massage chairs
- Industrial and Manufacturing:
 - Machine tools (drill press, NC lathe, screw fastener, drill machine)

- Power tools

UNIQUE VALUE PROPOSITION

The split stator core structure of the motor allows it to be smaller and lighter without compromising its ability to handle increased power output. This feature enables products that use the motor to maintain their performance while becoming more compact and lightweight. Alternatively, the motor can be used to enhance the product's performance without increasing its size.

Furthermore, the motor's high-function control system allows it to adjust its performance based on the load. For instance, it can control the number of revolutions or stop according to the load. This capability enables the addition of new product features, which can lead to increased functionality and versatility.

Additionally, the motor's robustness against water and dust makes it suitable for products used in harsh environments, such as outdoor settings. This feature enhances the durability and reliability of the product and extends its lifespan.

The technology owner is keen to do R&D collaboration and licensing out the know-how to a variety of applications developers such as robotics, electric vehicles, and industrial automation systems.