

ECM Unveils Next-Gen PCB Stator Servo Solution with Integrated Harmonic Drive



CHALLENGE

Industries such as robotics, automation, medical devices, and aerospace are constantly pushing the boundaries of performance and efficiency. However, engineers in these sectors face a common set of challenges:

- **Space Constraints:** Traditional servo motors can be bulky, limiting integration possibilities.
- **Weight Sensitivity:** Every gram matters in aerospace and medical devices, where lighter components reduce inertia and power consumption.
- **Torque Density:** Applications require high torque output without sacrificing compactness.
- **Precision & Reliability:** Advanced tasks demand smooth, accurate motion control with minimal cogging and robust feedback mechanisms.

SOLUTION

ECM PCB Stator Technology's new High-Torque 50:1 Harmonic Drive—nicknamed the 'Eight Ball'—directly tackles these challenges by offering an ultra-compact, lightweight, and torque-dense servo motor that fits seamlessly into space-constrained applications.

KEY INNOVATIONS

Compact & Lightweight Design

The Eight Ball's ultra-compact dimensions (2.95" x 3.35" x 1.96") and minimal weight (only 0.57 kg/1.26 lbs) allow seamless integration into space-constrained systems, reducing overall system complexity.

High Torque Performance

Despite its compact form factor, the motor delivers a remarkable 33.9 Nm of peak torque and 18.8 Nm of continuous torque, powered by an integrated 50:1 harmonic drive for robust performance in demanding applications..

Precise Control

A dual encoder system provides closed-loop feedback, ensuring smooth, cog-free operation with accurate speed and position control—essential for high-precision tasks.

Efficiency Benefits

The innovative design not only enhances performance but also minimizes inertia and energy consumption, making it an ideal solution for applications where efficiency is critical.

REAL-WORLD APPLICATIONS

Robotics & Automation: High torque and precision enable smoother, more responsive robotic arms and automation systems.

Medical Devices: Compact form factor and low weight reduce mechanical stress, improving reliability in sensitive medical environments.

Aerospace: Every gram saved enhances efficiency and reduces fuel consumption, making the Eight Ball a prime candidate for aerial systems.

OUTCOME

By combining a harmonic drive with **PCB Stator** technology and dual encoders, **ECM** has created a servo motor that meets—and exceeds—the demands of modern engineering. The Eight Ball offers:

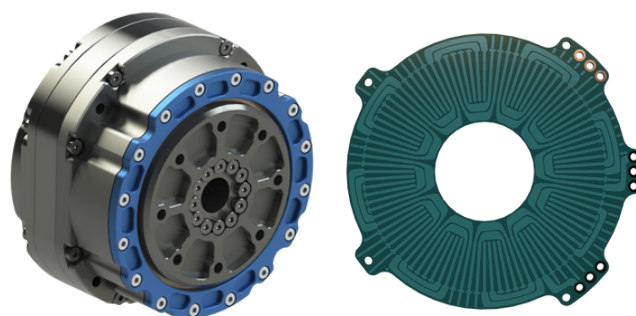
- **Precision & Reliability:** Dual encoders ensure the motor output matches the commanded position with minimal error.
- **Enhanced Durability:** The harmonic drive system is designed for smooth, long-lasting operation.
- **Broad Adaptability:** A flexible, thru-hole design accommodates various integration needs.

CONCLUSION

ECM's Eight Ball represents a new frontier in compact, high-torque servo motor solutions. Whether you're pushing the limits of robotic innovation, optimizing automation lines, or pioneering aerospace technologies, the Eight Ball delivers the performance, efficiency, and precision required to overcome today's most critical engineering challenges.

*"The Eight Ball is a testament to our relentless pursuit of innovation and excellence. By seamlessly integrating our **PCB Stator** technology with an advanced harmonic drive, we've created a servo motor that sets a new standard for performance and precision. This breakthrough not only empowers our customers to overcome their toughest engineering challenges but also opens up a world of possibilities in robotics, aerospace, and beyond."*

Brian Casey
CEO ECM PCB Stator Tech



Specification	Value
Nominal Mechanical Power	35W
Nominal Output Speed	60 RPM
Nominal Output Torque	5.2Nm (3.8 lb-ft)
Max Output Speed	110 RPM
Max Average Torque	18.8Nm (13.9lb-ft)
Gear Ratio	50:1
Power Supply Voltage	24 VDC
Nominal Phase Current	6.2 Apk
Max Inst Torque	≈34 Nm
Weight	1.36 lbs. (0.62 kg)
Axial Length	1.96" (49.8 mm)
Diameter	3.35" (86 mm)
Motor Controller	ECM Developed Controller; Absolute or Incremental Encoders