

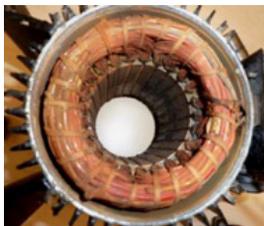
ECM's PCB Stator: *What's in your motor?*

ECMs patented technology fundamentally changes the way motors are designed and manufactured. At the heart of this revolutionizing change is ECM's stator design.

A stator is essentially the stationary part of a rotary motor or generator which interacts with magnets creating the magnetic flux. Historically, stators tend to be the bulkiest component of a motor or generator, comprised of layered copper windings and iron laminations.

ECM has developed a groundbreaking new stator design by embedding copper-etched conductors into a multi-layered printed circuit board (PCB) to form a stator. ECM's PCB stator is exactly what you think it would be — a circuit board, similar to what you'd find in your laptop or phone.

These PCB stators allow us to create remarkably thin, compact, lightweight motors without compromising torque. Motors that were previously unavailable to new technologies.

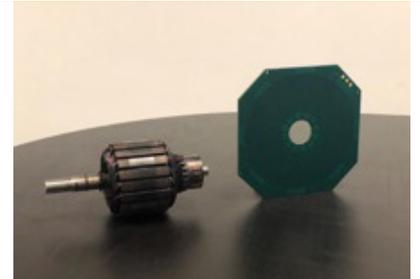


2.2kW Induction Stator
5kg Cu.
Total Motor Weight: 45kg



2.2kW ECM PCB Stator
600g Cu.
Total Motor Weight: 15kg

90W AUV ECM PCB STATOR MOTOR CLASSIFICATION



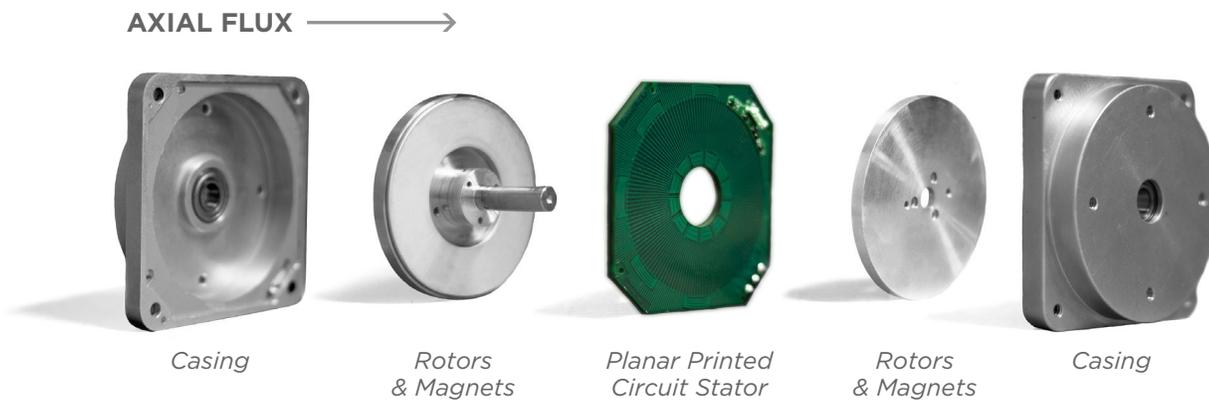
- > Axial flux
- > Air gap
- > Permanent Magnet
- > Synchronous Machine

Permanent magnet synchronous is also often called a brushless DC motor (BLDC), or sometimes an Electrically Commutated Motor (ECM).

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ECM PCB Stator Motor Design

ECM's technology platform leverages a proven manufacturing process, following the same well-established method utilized in the construction of printed circuit boards (PCBs). This results in a very reliable and cost effective production of an entirely new ironless and wireless generator, designed to replace existing conventional motion devices, generators, motors and engines.



Axial gap machines have superior attributes in many applications. While permanent magnets and today's power electronics have been applied to optimize both radial and axial gap machines, winding structures have been constrained by uniform wire diameter and geometry. ECM has perfected a process that optimizes copper geometries and winding patterns which deliver superior efficiency at a reduced cost.

PROPERTY	LEGACY STATOR	ECM'S PCB STATOR
Zero Iron	N	Y
Encapsulated Copper Windings	N	Y
Optimized/Reduced Copper Use	N	Y
Weight	Heavy, Bulky	Lightweight, Thin
Cost Effective at Large Scale	Y	Y