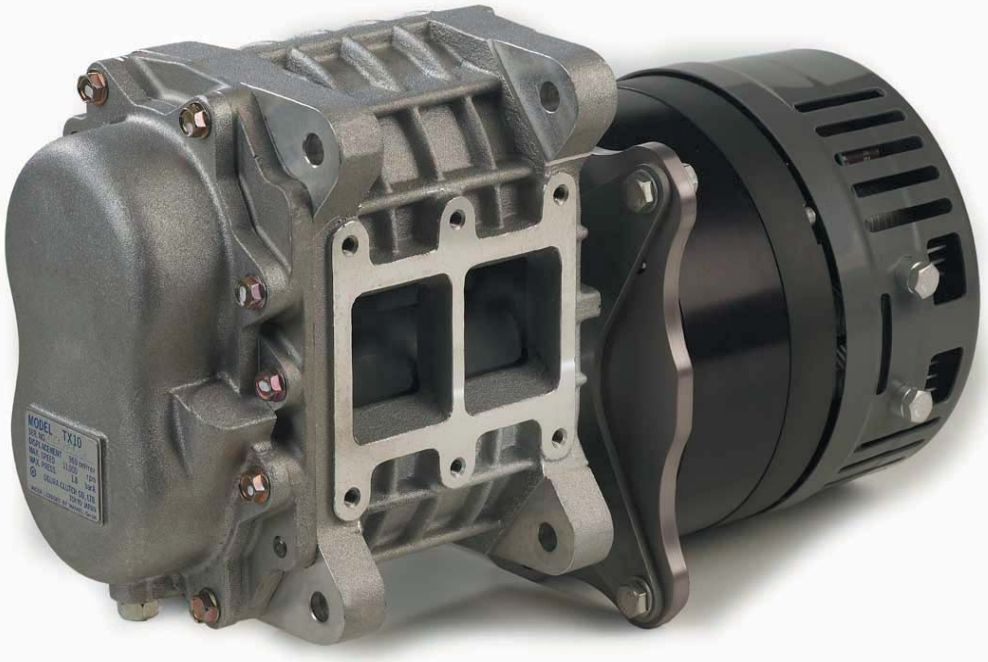
Low Voltage Hybrid Supercharger

going green has never been easier

eCycle has developed an electric supercharger for internal combustion engines, with the collaboration of the Ogura Clutch Company. This system uses a low voltage DC bus and an 11kW brushless motor to drive a compressor; ultimately providing a substantial reservoir of on-demand power. In addition to downsizing the engine, the electric supercharger, integrated starter alternator, and battery bank hybridize the power train.

What is a supercharger?

A supercharger mechanically forces air into an engine to increase performance. Superchargers have been around since WWII and are found in cars, trucks, boats and airplanes. Unlike traditional superchargers that use belts and are powered directly by the vehicle's engine, eCycle's hybrid supercharger operates independent of engine speed.



eCycle's hybrid supercharger consists of a SolidSlot™ brushless motor/generator and an Ogura compressor. The supercharger is a practical bolt-on machine that increases efficiency and performance, while reducing emissions for a variety of engines in automotive, mass transit, truck and marine platforms.

Unlike conventional belt-driven superchargers, the Hybrid Supercharger is driven by a SolidSlot™ brushless motor/generator that delivers instant boost, independent of engine speed.

Automotive | Transit | Trucking | Aerospace | Defense | Powersports | Marine | Power Generation

eCycle, Inc.
Advanced Brushless Motors
Hybrid Technology

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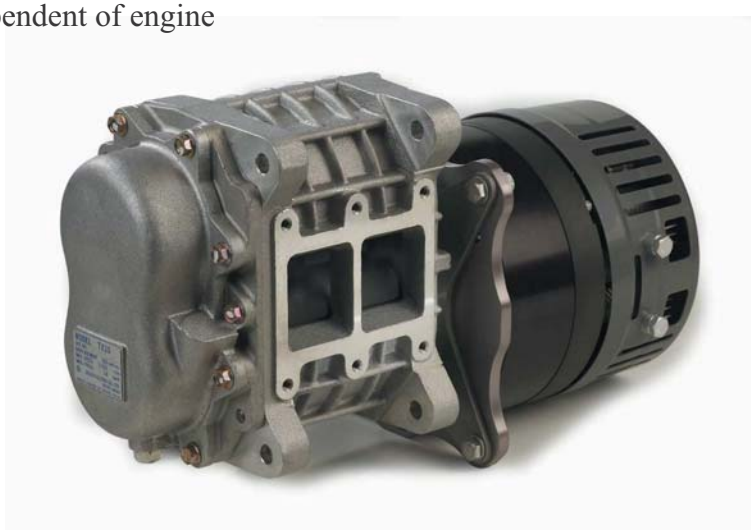
Features

- Less parasitic - No belts, operates completely independent of engine
- Full pressure at low engine speed
- Variable speed
- Low voltage operation (12 to 48VDC)
- Increases engine efficiency
- Greater acceleration - up to 100% higher torque and power depending on application
- Bolt-on performance for OEM's, aftermarket
- Up to 15psi delivered (above ambient)
- Electronically controlled
- Can be further utilized as a starter/alternator (ISA)



Hybrid Vehicle Configuration

There are two commonly accepted methods for hybridization, series and parallel. A series hybrid employs a distinct gen-set for battery charging and powering of one or more traction motors, with no mechanical coupling of engine and wheels. A parallel hybrid is an engine-based powertrain bolstered by a motor/generator and controls with a supporting battery bank. In both examples, high voltage is employed for on-road application to provide sufficient performance.

A hybrid supercharger is a new way to hybridize a vehicle. The hybrid supercharger is similar to a conventional belt or gear driven unit, except that a low voltage battery bank and brushless motor power the compressor. It can be operated independent of engine speed, mainly to increase low-end torque. Because a supercharger enhances the engine by delivering more air to it, well established techniques for control – fuel injection and ignition – are utilized.

Importantly, a hybrid supercharger need only apply a small portion of traction power to the engine via compressed air, in order to achieve comparable output to other hybrid configurations. This affords a low battery bank voltage, with inherent advantages in cost and complexity. The system can be readily recharged while the vehicle is cruising, and also from an electrical outlet when parked, thereby creating a low cost plug-in hybrid, given the use suitably sized batteries.

In summary, vehicle hybridization is an accepted means of increasing fuel efficiency and reducing emissions. Today's hybrid vehicles supplement a gasoline or diesel-fueled internal combustion engine with an electric motor/generator to provide traction. eCycle's hybrid supercharger is a new and cost effective alternative.

- Unlike today's hybrids that spend 50kW to get 50kW performance, eCycle's supercharger spends 10kW to get 50kW performance
- Reduced cost through smaller engines
- Increased performance up to double power and double torque

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