

Delphi Power Box

Delphi's Power Box is a self-contained hybrid propulsion system that combines electronic components and a lithium-ion battery to simplify electrification and assembly of mild hybrid vehicles. A drop-in solution that typically fits behind the rear seat, the system is capable of both permanent magnet and induction machine control and can be applied across multiple vehicle platforms and powertrains.

▶ Benefits

- Building block technologies increase flexibility while helping to reduce cost and complexity
- Complete system integrated in a single housing
 - Interior mount; typically fits behind rear seat
 - Simplifies installation
- Simplifies hybridization of non-hybrid vehicle
- Improves fuel economy by 10-20%
- External manual disconnect helps facilitate safe, easy service and maintenance
- Applicable across multiple vehicle platforms and powertrain configurations
- Proprietary battery management algorithms contribute to longer cell life and increased battery safety



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▶ Functionality

- Converts high-voltage DC to three-phase power for traction motor drive
- Converts high-voltage DC to low-voltage DC power for conventional vehicle accessory loads
- Converts braking energy to charge battery
- Battery management controller enables state-of-charge and state-of-health calculations, cell balancing and thermal controls

▶ Single-box hybrid propulsion system includes:

- Hybrid control unit
- Motor controller
- Traction inverter
- DC / DC converter
- 120 V Li-ion Battery pack
- Bus distribution center
- Battery management controller
- High-voltage safety interlocks
- Thermal management subsystems
- System-ready software for motor and battery control

▶ Availability

- In production

► **Specifications**

Environmental	<ul style="list-style-type: none"> • Air-cooled • 80 to 134V_{dc} input operating voltage • -30 to +70°C ambient operation
DC / AC Inverter	<ul style="list-style-type: none"> • 120V • Three-phase AC motor • 20kW peak, vector-controlled • Up to 150 amps continuous phase current, with sufficient cooling • Peak phase current in excess of 300 amps
DC / DC Converter	<ul style="list-style-type: none"> • 1.6kW isolated 120 V_{dc} to 14 V_{dc} unidirectional • 12.5 – 15.5 V_{dc} output voltage range
Controller	<ul style="list-style-type: none"> • Main processor <ul style="list-style-type: none"> ○ 32-bit ○ 128 MHz Freescale Viper™ ○ 3Mbyte flash, 128Kbyte SRAM • Motor control processor <ul style="list-style-type: none"> ○ 128 MHz Freescale Taipan™ ○ 2Mbyte flash, 64Kbyte SRAM