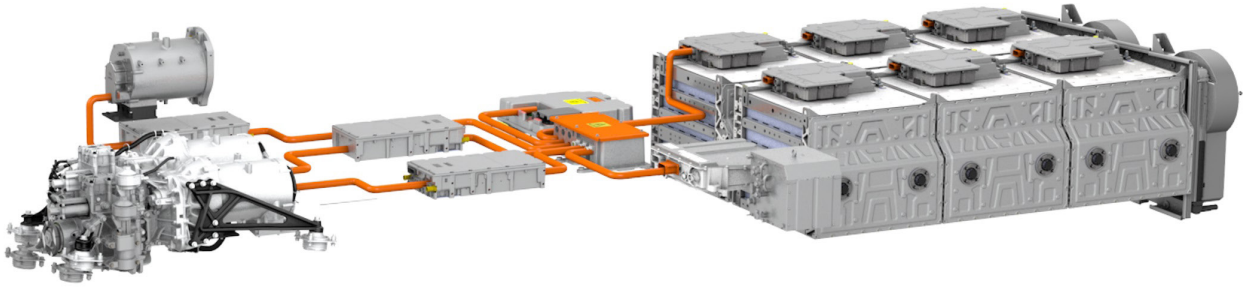


ELECTROMOBILITY SOLUTIONS

Volvo Penta Electric driveline



To meet both our customers' needs and requirements as well as the demands of the industry's future, our work with electromobility is based on full-system solutions.

The future is electric

It's a fact that the benefits of switching diesel-powered machines to their electric counterparts are numerous.

They will reduce emissions and help us to fight the global warming, significantly reduce noise and vibration levels, improve energy efficiency, reduce energy costs and increase uptime as they have fewer moving parts than their conventional counterparts.

Built on Volvo Group technology

As a proud part of the Volvo Group, Volvo Penta has the benefit of the strength and experience from the development and technological innovations from all other companies within the group.

Our collective ambition is to offer our customers the most competitive solutions when it comes to electrification, including batteries, electric motor drives and charging solutions.

This ambition gathers strength from already proven electromobility technology from Volvo Trucks, Volvo Construction Equipment and Volvo Buses, one of the world leaders within advanced electrification and hybrid technology, with electric power concepts that have undergone hundreds of thousands of testing hours and real-world use.

Tailor-made electromobility systems

This approach is built on close collaboration – partnering with customers, evaluating the specific challenges at hand to develop a perfect fit for each application.

- **Tailor-made electrification approach built on close customer collaboration**
- **Proven electromobility technology from the Volvo Group**
- **Positive climate impact by reduced emission levels**
- **Lower noise and vibration levels**
- **Increase of uptime with less moving parts**

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Technical data

Energy Storage System (ESS)

Configuration* up to 6 packs
Installed pack capacity..... 90 kWh
Continuous power91 kW
Peak power91 kW
ChemistryLi-ion NCA
Voltage.....500 - 750 VCD

*) Configuration with high power battery variant up to 2 packs.

Electric Machine (EM)	EM1	EM2	EM3
Continuous power, kW	150	75	50
Peak power, kW	200	88	65
Continuous torque, Nm	310	200	145
Peak torque, Nm	430	300	240
Maximum speed, rpm	9500	6000	5000
Cooling	Liquid cooled	Liquid cooled	Liquid cooled

Performance data of electric machines are considered as a stand-alone. Complete system performance of the motors may vary based on the system configuration and design choices.

Gearbox EPT802

Gear	Ratio
1	9.53:1
2	3.52:1
Fixed (EM2)	3.67:1

Gearbox EPT402

Gear	Ratio
1	7.99:1
2	3.52:1

Dimensions

	EM1	EM2	EM3	ACU	ESS
Length, mm	424	392	342	296	768
Width, mm	280	210	210	346	684
Height, mm	362	233	233	311	668
Weight, kg	80*	61*	51*	23*	535*

*) Dry weight

	Gearbox EPT802*	Gearbox EPT402 *
Length, mm	1004	900
Width, mm	664	542
Height, mm	450	450
Dry weight, kg	345	187
Oil capacity, liter	11.9	5.9
Installation angel, degree		
Longitudinal	0 (min), 7.5 (max)	
Transversal	-1 (min), +1 (max)	

*) with EM's

Technical description

Energy Storage System

- A single or multiple battery packs together, including necessary power management control units, form an Energy Storage System (ESS) and is used to store energy.
- As an essential safety feature, the battery pack has a pair of internal contactors (high-power relays) allowing the battery pack to be disconnected from the vehicles traction voltage system in case of emergency situations, service or repair situations.

Charging

- The system support both AC and DC charging, up to 43kW AC and 250kW DC charging.
- CCS1 and CCS2 interface for US and EU.

Electric Machine

- The Electric Machine (EM) is a three-phase motor of permanent magnet type and it operates directly on the input shaft of the vehicle's gearbox. Nominal power output is depending on temperature and load.
- Driveline functionalities:
 1. Motor (to propel the vehicle)
 2. Alternator (to generate electric power)
 3. Regenerative braking (to decelerate the vehicle)

Electric Motor Drives

- Primary function of the Electric Motor Drive (EMD) is to control the speed and torque of the Electric Machine.

Active Cooling Unit

- The Active Cooling Unit (ACU) is a heat pump designed to transfer heat from battery pack through the primary cooling circuit and the Motor Drive System (MDS) through the secondary cooling circuit. The ACU is designed to keep optimum temperatures for the battery cells and MDS.
- The logic in the ACU is powered from the 24V system and is controlled by the HPCU through a signal interface on the front of the ACU.
- The compressor in the ACU (managing the heat transfer) is powered from traction voltage system.
- The ACU includes refrigerant compressor, water cooled condenser, drier, expansion valve, evaporator (chiller), pressure sensor, coolant connections, housing and a base plate.

Contact your local Volvo Penta dealer
for more information regarding Volvo
Penta engines and optional equipment/
accessories or visit
www.volvopenta.com



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Please note that products illustrated may differ from production models.

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