Voith Electrical Drive System (VEDS) Specification

Primary Propulsion Unit and Traction Motor - Electric Propulsion

- The vehicle shall be propelled by a Voith Electrical Drive System (VEDS). It shall be a chassis mounted synchronous permanent magnet central drive motor with three phase motor-technology. The motor shall be connected to the drive axle with a conventional style drive line. The driveline shall not use a multispeed transmission or gear reduction unit, to improve reliability and reduce weight. The motor shall be matched with a compatible drive Invertor that is ISO 26262 fully compliant and has Automotive Safety Integrity Level C (ASIL C). The motor shall have a peak efficiency of minimum 97%, and a broad range with efficiency over 95%. The motor shall accelerate the vehicle while under power and deaccelerate the vehicle during braking by regenerating power to the batteries. The motor shall have a minimum peak torque of 3,000Nm available from standstill, a peak power of more than 400kW and shall sustain peak values for a minimum of 30 seconds to ensure proper startability on steep grades at GVW loads. The motor shall have a continuous torque of more than 2,000Nm and a continuous power of more than 300kW.. The motor and the invertor shall be capable of handling a voltage level range of 400-850 V and be cooled with Water Ethylene Glycol. The system shall be fully compliant with ISO 26262 and have a minimum Ingression Protection Class equal to IP6K9K. For safety reasons, regeneration must be possible even when the Energy Storage System (ESS) is not able to accept additional loads by having an integrated brake chopper, brake resistors and an integrated safety controller. The central motor and drive invertor both shall have aluminum housing.

Voith Electrical Drive System Technical Specifications

Overview

- e-motor Peak efficiency of more than 97%
- Maximum power of more than 400kW (at 650V DC link voltage)
- Continuous power of more than 300kW.
- Maximum torque of more than 3,000Nm
- Continuous torque of more than 2,000Nm
- Central drive motor
- Synchronous Permanent magnet motor technology
- Maximum Torque available from standstill and for more than 30 seconds
- Fully Compliance to ISO 26262
- Regeneration up to 50% of the total motor energy (depending on application)
- No damage of drive inverter if there is a short circuit at the motor windings
- towing of the vehicle must be possible with max. Speed without any additional measures (e.g. disconnecting of prop-shaft)

Central Motor HD

- More than 400 kW peak power
- More than 300 kW S2 power
- 3,100Nm max. torque
- Up to 3,800 rpm
- Aluminum housing
- Water cooled
- Prepared for KITAS sensor
- Output shaft 150KV or 180 KV
- IP6K9K
- Ø450x680mm / 315 kg

Drive Inverter HD

- Up to 850 Aeff
- Voltage Levels 400-850 V
- Aluminum housing
- Water cooled
- Integrated brake chopper (option)
- Integrated safety controller
- Controller Board in AEC-Q100
- IP6K9K
- Approx. 50kg / 600x505x252mm
- ISO 26262 compliant; ASIL C