

## Press Release

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June 2013

### **Artic Tram Drives Quietly and Energy-Efficiently Through Helsinki - With Voith Traction Equipment**

**On 13 June the first of the altogether 40 new Artic low-floor trams for Helsinki, Finland, were inaugurated in the presence of the Finnish Minister of Traffic. The electric drive system for the vehicles has been supplied by Voith.**

The conditions of the rail network are characterized by the city's extreme climate. Minus degrees with permafrost, salty condensation and summer temperatures of up to 30 degrees centigrade make high demands on track bed and rails. These circumstances were taken into account when the operator Helsinki City Transport (HKL) called for tenders and consequently resulted in a rather demanding catalog of requirements.

The vehicle to be presented has been optimally adapted to these Scandinavian conditions. Apart from offering maximum traveling comfort it stands out by particular robustness, low life-cycle costs and a reliable traction system.

The operator's requirements were met by the consortium Transtech and Voith with the Artic low-floor tram. Despite a freely pivoting bogie with continuous axles it was possible to achieve a 100% low-floor configuration. A separate motor-gear unit with a continuous output of 65 kW drives each of the eight axles of the 27.6-meter long vehicle. The

axles receive their input power via two EmCon double traction inverters with a continuous output of 2 times 180 kW. Wheels, axles, axle bearings, the drive-related vehicle control and the diagnosis system complete the Voith delivery scope.

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The redundant drive design allows the Artic tram to continue operation with full passenger capacity and without power losses if one of the bogies fails. Even if half the traction system stops working, the tram is still able to return to the depot at reduced power. The operator is thus spared any time-consuming towing procedures.

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Braking heat recuperation allows more efficient operation. The intelligent braking energy management was designed in such a way that converted energy generated during braking is fed back into the overhead contact wire. Should the overhead network be unable to take up power, the braking energy is stored in especially designed heat exchangers and used for the heating system as needed. In addition, the up to 199 passengers in the Artic benefit from a floor heating system, which also reduces the risk of wheel slip, as it quickly dries the vehicle floor.

Another special feature ensuring higher driving comfort is a system that prevents excessive horizontal acceleration of the vehicle in bends. By measuring the offset angle between bogie and vehicle, the system determines the radius of the curve. If the car is driving too fast, a control device ensures that the vehicle speed is limited. As a result, passengers are protected as unpleasant centrifugal forces are minimized.

Trams are an important public transport medium in Helsinki. On eleven lines and across 118 kilometers, 112 vehicles of HKL move 57 million passengers per year. Between now and 2018, the 40 new Artic low-floor trams will successively supplement the fleet.



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*Double traction inverters from Voith*

**Voith Turbo, the specialist for hydrodynamic drive, coupling and braking systems for road, rail and industrial applications, as well as for ship propulsion systems, is a Group Division of Voith GmbH.**

**Voith sets standards in the markets energy, oil & gas, paper, raw materials and transportation & automotive. Founded in 1867, Voith employs almost 42,000 people, generates €5.7 billion in sales, operates in about 50 countries around the world and is today one of the biggest family-owned companies in Europe.**

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