



# Electric traction system

## Modernization of low-floor trains for the Forchbahn

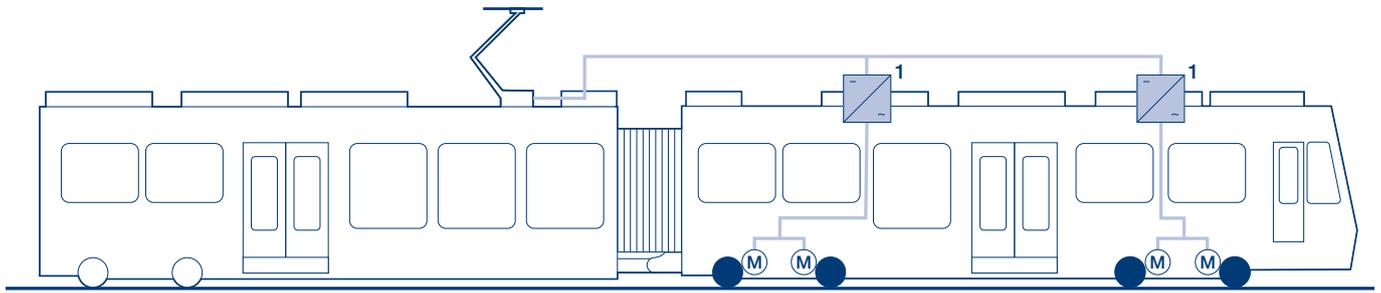
The Forchbahn is a 16.4 km long suburban railway connection between Zurich-Stadelhofen and Esslingen. In the city area of Zurich, the low-floor trains use the tram rails and catenary wires with a supply voltage of 600 VDC, while on the 13 km long interurban section the supply voltage is 1200 VDC.

In autumn 2018, Stadler Rail was awarded by the Forchbahn AG with the comprehensive modernization of all its 13 low-floor trains type Be 4/6 in order to ensure a reliable and safe operation of these vehicles until the year 2037.

For this project, Voith will deliver 26 new, modern and tailor-made traction inverters to Stadler Rail, which can handle the two different supply voltages.

<b>Vehicle manufacturer</b>	Stadler Rail, Switzerland
<b>Operator</b>	Forchbahn AG, Switzerland
<b>Year of manufacturing</b>	2004, Modernisation 2019 - 2024
<b>Track gauge</b>	1000 mm
<b>Vehicle length</b>	25.2 m
<b>Tara weight</b>	33.7 t
<b>Axle arrangement</b>	Bo'Bo' + 2'
<b>Maximal speed</b>	80 km/h
<b>Catenary wire voltage</b>	600 / 1200 VDC
<b>Maximum power</b>	540 kW

## Traction system



1 Traction inverter

## Traction inverter EmCon I1600-7AR

The both traction inverters of type I1600-7AR are installed on the vehicle roof, and they are the core product of the modernized traction system. The existing interfaces on the vehicle are considered best possible in order to keep the adaption effort small.

This traction inverter provides continuous power up to 460 kVA and a short-time peak power of 760 kVA to both connected traction motors. The operation is possible with 600 VDC as well as 1200 VDC supply voltage. The cooling of the traction inverter is done by air.

The traction inverter contains the newest power electronics with a compact, maintenance-friendly and low-loss design. Also, the traction control unit and the IO control unit VPort, which is the interface between the traction converter and the higher-order vehicle control system, are integrated in the device.

All inside the traction inverter, situated components are easily accessible from the top through lids. This simplifies maintenance and fault diagnosis and is therefore a significant improvement compared to the previous model.



Voith Group  
St. Poeltener Str. 43  
89522 Heidenheim  
Germany

[www.voith.com](http://www.voith.com)

Contact:  
Phone +43 27 42 806-0  
[electric-drives@voith.com](mailto:electric-drives@voith.com)



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