The Finnish cities Helsinki, Espoo, Vantaa and Kauniainen together with the Finnish Railways (VR) have jointly founded the company Pääkaupunkiseudun Junakalusto Oy (Junakalusto Oy), that ordered from Stadler Bussnang AG 81 four-car trains (EMU’s) for the commuter traffic of Helsinki Metropolitan Area. Junakalusto Oy will lease the procured trains to Helsinki Region Transport (HSL). VR-Group Ltd will operate the new Sm5 trains like the other commuter trains. Stadler’s FLIRT train has been adapted for the Finnish conditions by making the necessary modifications, e.g. the car body has been adjusted to the Finnish vehicle gauge and the bogie to the Finnish track gauge. Furthermore, the trains have been designed for the extreme climatic challenges of the Finnish winter by taking the requirements to the thermal insulation etc. into account. The trains are equipped for the first time in Finland with a heat recuperation system of the HVAC.
Technical features

Vehicle data

**Customer**
Junakalusto Oy, Finland

**Lines operated**
Helsinki district and southern Finland

**Gauge**
1524 mm

**Designation**
Sm5

**Catenary voltage**
25 kV, 50 Hz

**Axle arrangement**
Bo’2’2’2’Bo’

**Number of trains**
32+9+34+6

**Service start-up**
2009/2010

**Seating capacity**
238

**Fold-up seats**
34

**Standing capacity (4 Pers./m²)**
340 (accord. to DIN 25008)

**Floor height**
- Low floor: 600 mm
- High floor: 1120 mm

**Door width**
1300 mm

**Longitudinal strength**
1500 kN

**Overall length**
75200 mm

**Vehicle width**
3200 mm

**Vehicle height**
4400 mm

**Bogie wheelbase**
- Motor bogie: 2700 mm
- Trailer bogie: 2750 mm

**Powered wheel diameter (new)**
870 mm

**Trailer wheel diameter (new)**
800 mm

**Continuous power at wheel**
2000 kW

**Maximum power at wheel**
2600 kW

**Starting tractive effort (up to 47 km/h)**
200 kN

**Max. acceleration (full load)**
1.2 m/s²

**Service speed**
160 km/h

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**Technology**
- Automatic coupler
- Welded car body structure with extruded aluminum profiles
- Air-suspended bogies
- Multiple-traction up to three trains

**Comfort**
- Bright, passenger-friendly interior with customized design
- Excellent visibility through the whole passenger area
- Low-floor section > 70%
- Passenger information system
- Spacious multipurpose area in entrance section
- 6 doors on each side for fast entry and exit of passengers
- Door to the multipurpose area that complies with the TSI PRM is equipped with a moveable step that covers the gap between the doorstep and platform
- Air-conditioned passenger and driver compartments
- Vacuum toilet system, also suitable for people with reduced mobility

**Personnel**
- Ergonomically designed driver’s desk
- Glass fiber reinforced plastic front cabin

**Reliability / Availability / Maintainability / Safety**
- Redundant traction chain with 4 water-cooled IGBT power converters
- Vehicle control system with train bus, vehicle bus and diagnostic computer
- Video surveillance

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