



# ELECTRIC DOUBLE-DECKER MULTIPLE UNIT KISS

MÁV-START Zrt., Budapest

On 12 April 2017, Stadler signed a frame agreement with the Hungarian state railway company, MÁV-START Zrt, for the delivery of minimum 10 and up to 40 6-car KISS electrical multiple units. The new high-capacity trains will be the first double-decker units in Hungarian railway history. The vehicles will operate on the suburban lines of the Hungarian railways around Budapest with a top speed of 160 km/h, and will provide seating for a total of 600 passengers. The new trains are compatible with the existing 123 FLIRT EMUs delivered by Stadler in the past ten years, providing MAV with exceptional operational flexibility. The trains will be equipped with four toilets, one of them accessible for persons with reduced mobility, while the multifunctional areas will have capacity for four wheelchairs, as well as twelve bicycles or five strollers. The new vehicles have been designed according to the latest safety standards and will be equipped with EVM and ETCS Level2 train control systems. Passenger comfort will be enhanced by the exceptionally smooth running, a state-of-the-art passenger information system, a spacious and bright interior, cutting edge air conditioning, and free WIFI.

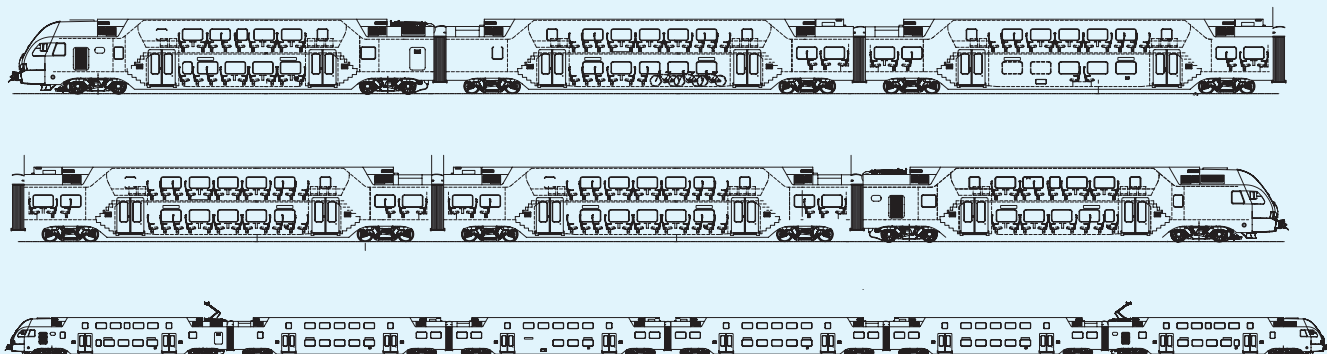
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## Technical features

### Technology

- Lightweight car bodies in integral aluminium design in line with the latest standards for crashworthiness (EN 15227) and car body strength (EN 12663)
- Motor bogies and trailer bogies with pneumatic suspension
- EVM and ETCS Level2 train control systems

### Comfort

- HVAC systems for passenger compartments and drivers' cabs, with fresh air circulating via the perforated ceiling, and a panel heating system
- Bright, passenger-friendly interior with scope for individual design
- Generously dimensioned entrance areas for optimum passenger flow
- 12 entrance doors on each side for rapid exchange of passengers
- Four toilets, one with wheelchair access

### Personnel

- Ergonomically and comfortably designed working environment to prevent driver fatigue
- User-friendly passenger information systems
- Driver's cab for operation with driver and assistant

### Reliability/Availability/Maintainability/Safety

- Vehicle control system with train bus and diagnostics computer (CANopen bus)
- Redundant drive equipment with four power trains with water-cooled IGBT power converters
- Clear layout compartments for passenger's orientation and safety

## Vehicle data

<b>Customer</b>	MÁV-START Zrt.
<b>Operated networks</b>	Suburban lines of Budapest
<b>Track gauge</b>	1435 mm
<b>Designation</b>	Suburban traffic
<b>Supply voltage</b>	25kV 50Hz
<b>Axle arrangement</b>	Bo'Bo' + 2'2' + 2'2' + 2'2' + 2'2' + Bo'Bo'
<b>Number of vehicles</b>	Minimum 11 up to 40 units (frame contract)
<b>Service start-up</b>	2019
<b>Seats</b>	600
<b>Floor height</b>	
Low-floor	440 mm
High-floor	1350 mm
<b>Entrance width</b>	1300 mm
<b>Longitudinal force</b>	1500 kN
<b>Length over coupling</b>	155.88 m
<b>Vehicle width</b>	2800 mm
<b>Vehicle height</b>	4595 mm
<b>Bogie wheelbase</b>	
Motor bogie	2500
Trailer bogie	2500
<b>Driving wheel diameter, new</b>	920 mm
<b>Carrying wheel diameter, new</b>	920 mm
<b>Continuous power at wheel</b>	4000 kW
<b>Max. power at wheel</b>	6000 kW
<b>Starting tractive effort</b>	400 kN
<b>Starting acceleration (&lt;54km/h)</b>	1.1m/s <sup>2</sup>
<b>Maximum speed</b>	160 km/h