



35 SIX-CAR INSPIRO METRO TRAINS

Metro Warsaw, Poland

In February 2011, Siemens was awarded the contract to supply 35 new six-car metro trains for Metro Warsaw. The vehicles are part of the Inspiro platform. The first ten trains were completely produced in Siemens' Vienna plant. The final assembly of the remaining vehicles was carried out in Nowy Sącz, Poland, by the consortium partner NEWAG SA. All the trains were delivered to Warsaw in 2014.

Dynamic commissioning of the first train including type testing took place at the Siemens test center in Wegberg-Wildenrath and subsequently on site in Warsaw. The Inspiro design was developed by BMW Group subsidiary Designworks USA.

The vehicles are made up of modular design components. The car body itself is designed as a lightweight aluminum-profile construction. All the materials used were chosen with a view to minimizing the environmental impact and enhancing recyclability.

Each six-car train is capable of carrying up to 1,502 passengers (at 7 people/m²) with seating for 234. Wide and open gangways enable unrestricted passage throughout the entire train. For optimal interior climate conditions, the driver's cab is equipped with a compact air conditioning unit and the passengers' compartment has a ventilation system.

The individual cars are connected via semi-permanent couplers and a semi-automatic coupler in the middle of the train enables fast separation of the trainset. Both halves of the train can be operated separately for shunting purposes. The end cars have automatic couplers that also make it possible to tow the older vehicles.

Power (750 V DC) is supplied via the third rail. Two-thirds of the train's axles are electrically driven. In each motor car, the four traction motors are controlled by a proven Sibac® IGBT VVVF inverter. Sitrac® control allows electrodynamic braking to a standstill. This feature provides the advantage of a non-wearing service brake under normal conditions and, in particular, improves stopping accuracy.

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Technical Data

Train configuration	Mc-T-M-M-T-Mc
Wheel arrangement	Bo'Bo'+2'2'+Bo'Bo'+Bo'Bo'+2'2'+Bo'Bo'
Car body material	Aluminum
Track gauge	1,435 mm
Length over couplers	approx. 117,800 mm
Width of car	2,740 mm
Floor height above top of rail	1,130 mm
Wheel diameter new / worn	850 / 770 mm
Tare weight / total weight (7 passengers/m ²)	approx. 163,000 kg / approx. 265,000 kg
Maximum axle load	12.6 t
Number of seats	234
Train capacity (7 passengers/m ²)	1,502
Passenger doors per car	8
Minimum curve radius service line / depot	300 m / 60 m
Maximum gradient	4.5%
Maximum speed	90 km/h
Power supply	750 V DC / Third rail

- Car bodies of lightweight aluminum-profile construction
- Eight electrically powered exterior sliding doors (1,400 mm opening width) per car for optimal passenger flow
- Driver's cab with ergonomic driver's desk and central touch screen
- A reliable multifunctional vehicle bus (MVB) controls the vehicle based on the proven Sibas 32® system; data communication is via Ethernet and WLAN
- Information displays and CCTV system (including external camera) for maximum passenger comfort and safety

- Electrodynamic braking to a standstill for a non-wearing service brake and high stopping accuracy
- Sensorless control of the traction motors increases vehicle reliability
- At the end of their service life, the vehicles are 95 percent recyclable (Environmental Product Declaration according to ISO 14021)



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Otto-Hahn-Ring 6
81739 Munich
Germany

contact.mobility@siemens.com

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