



METRO EMU

Nexus, Tyne and Wear, UK

In January 2020, Nexus ordered 42 new METRO trains from Stadler for a complete fleet renewal on the Tyne and Wear Metro network serving Newcastle upon Tyne, Gateshead, South Tyneside, North Tyneside and Sunderland in Tyne and Wear. With their outstanding reliability, the modern Stadler METRO trains provide an additional boost to an intensively used network that forms the centrepiece of the local public transport system of the whole region. Stadler has conceived a vehicle that addresses the specific needs of the customer and provides world class facilities for the Metro passengers. The lightweight articulated five-car units allow for an efficient and cost-effective operation. The low-floor vehicle solution combined with the use of retractable steps offers level boarding throughout the network. Compared to the metrocars (class 599) from 1980, the new units offer considerably lower energy consumption thanks to the light weight vehicle design, the efficient recovery of braking energy and the use of the latest, highly efficient traction converter technology. The units are prepared for the integration of an energy storage system, allowing to serve potential extension lines added to the network in the near future. The interior of the vehicles is bright and open. Optimum use has been made of the space available and dedicated areas have been created for wheelchairs, prams, luggage and bicycles. This interior concept will enhance the passenger's perception of safety, with full CCTV coverage, protective systems for door operation and clear warning indicators. Power is supplied via overhead line at 1500 V DC. The vehicles are designed for a maximum running speed of 80 km/h. Efficient thermal and acoustic isolation ensure a comfortable passenger environment, and newly developed bogies with pneumatic suspension contribute to a smoother ride.

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Technical features

Technology

- Lightweight carriage body made of extruded aluminium profiles
- Advanced Crashworthiness, enabling safe mixed operation on heavy rail track
- Newly developed Jacobs motor bogies and trailer bogies with pneumatic suspension
- Disc, electrical and magnetic track brakes
- Advanced wheel slip slide detection and sanding, to reduce and mitigate instances of low rail adhesion
- Modern vehicle control and monitoring system
- Automatic front coupler for multiple operation
- Plug sliding doors and sliding steps for level entrance
- Low energy consumption due to light weight vehicle, brake energy recovery and the latest traction converter technology
- Powerful traction batteries allowing emergency operation independently of power supply; prepared for addition of larger energy storage capacity

Comfort

- Bright, passenger-friendly interior with an iconic design
- Continuous passenger space with open gangways, supporting passenger flow and transparency for a high perceived passenger safety
- Eight entrance doorways on each side for rapid passenger flow
- Level access supported by retractable steps at all entrances
- Cantilever seating to allow storage of luggage beneath seats
- Charging points for mobile devices
- Spacious multifunction areas and wheelchair spaces
- Modern passenger information system and CCTV
- Powerful HVAC system and comfortable floor heating

Personnel

- Spacious full-width cab with excellent driver sight lines
- Ergonomically designed driver's desk
- Automated cab side door for comfortable access
- Driver Advisory System for energy optimised operation
- External CCTV cameras supporting safe train dispatch

Reliability/Availability/Maintainability/Safety

- Redundant traction equipment with maintenance-friendly water-cooled IGBT power converters
- Remote vehicle diagnostics to support condition-based maintenance

Vehicle data

Customer	Nexus
Operated networks	Tyne and Wear Metro
Gauge	1435 mm
Designation	METRO EMU
Supply voltage	1500 V DC
Axle arrangement	2'(Bo)'(Bo)'(Bo)'2'
Maximum Axle Load	12.5 t
Suspension (Secondary/Primary)	Air / Metal-rubber springs
Number of vehicles	42
Delivery	2023/2024
Seats (inc Tip-up)	116
Standing spaces	450
Floor height	940 mm ToR
Entrance width	1400 mm
Longitudinal force	800 kN
Length over coupling	59 900 mm
Vehicle width	2650 mm
Vehicle height	3445 mm
Bogie wheelbase	
Motor bogie	2200 mm
Trailer bogie	2000 mm
Driving wheel diameter, new	720 mm
Carrying wheel diameter, new	720 mm
Continuous power at wheel	942 kW
Max. power at wheel	1320 kW
Starting tractive effort	140 kN
Starting acceleration, gross	1.2 m/s ²
Full service braking distance	250 m
Emergency braking distance	150 m
Maximum speed	80 km/h