



FLIRT TRI-MODE MULTIPLE UNIT

Transport for Wales

In January 2019, Stadler was awarded a contract to manufacture and supply 36 three-car CITYLINK three-car tram-trains and 35 FLIRTs (fast, light, intercity and regional train), for operation on the South Wales rail network. Twenty-four of the FLIRTs are tri-mode multiple units. Seven are three-car trains and 17 are four-car trains. They will be powered by electricity to the north of Cardiff and diesel to the south, providing cross-city connectivity. The use of overhead contact lines at 25 kV / 50 Hz and on non-electrified lines, using on-board traction battery power, will promote seamless travel for the passenger. A diesel-electric power supply enables batteries to be charged, and thanks to the application of the traction battery system, the client can avoid costly electrification extensions along the routes. The traction battery and diesel motor are located in the powerpack, which is separate from the passenger area. In both battery and electric mode, this reduces noise. Diesel power is limited to certain areas, to keep emissions to a minimum. Complying with the latest TSI-standards, the vehicles have been tailored to Transport for Wales' needs and designed to suit the local infrastructure. Low flooring ensures level boarding at every door to reduce dwell time and to make it easier for passengers to get on and off. All trains feature air-conditioning, areas for wheelchairs, pushchairs and bicycles, passenger information systems, and wi-fi. The FLIRT UK is part of Stadler's successful FLIRT family, which has seen more than 2,000 trains sold in 20 countries.

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Technical features

Technology

- Emission-free travel under overhead contact lines and during battery operation
- 25 kV/50 Hz AC, battery and diesel-electric propulsion (diesel with newest emission standard Stage V)
- Balise-supported traction mode change and automated passenger door operation
- Car-bodies made of welded extruded aluminum profiles
- Front cabin made of glass-reinforced plastic
- Air-suspended motor and Jacobs bogies
- High tractive effort and acceleration
- Multiple unit traction for up to two units
- Energy-efficient driving thanks to an integrated driver advisory system

Comfort

- Gap-free boarding and low-floor in entrance areas
- Bright, passenger-friendly interior design with comfortable seats and client-specific design
- Air-conditioned passenger compartments and driver's cabs
- Reduced vibration and noise emissions during diesel operation thanks to the isolated powerpack carriage
- Controlled emission toilets, also suitable for PRM passengers
- Designated areas for wheelchairs, pushchairs and bicycles in the passenger compartments
- Passenger information systems and wi-fi

Personnel

- Separate entry for driver
- Ergonomically-designed driver's desk
- Driver and conductor control panel for the passenger door control including communication
- TSI-compliant GSM-R train radio

Reliability/Availability/Maintainability/Safety

- Redundant power-train with water-cooled IGBT power converters
- Powerpack with integrated traction batteries and redundant diesel motor generator
- Easy access for maintenance
- Prepared for installation of ETCS
- Vehicle control system with train bus and diagnostics computer (CAN open bus)

Vehicle data

	4-car	3-car
Customer	Transport for Wales	Transport for Wales
Operated networks	Wales and Borders	Wales and Borders
Gauge	1,435 mm	1,435 mm
Designation	FLIRT UK	FLIRT UK
Power supply for propulsion	25 kV/50 Hz/ battery / diesel- electric	25 kV/50 Hz/ battery / diesel- electric
Output of the diesel units	480 kW	480 kW
Axle arrangement	Bo'2'2'2'2'Bo'	Bo'2'2'2'Bo'
Number of units	17	7
Seats in standard class	158	118
Tip-up seats	32	24
Standing capacity	204	148
Floor height, low-floor	960 mm	960 mm
Entrance width	1,300 mm	1,300 mm
Length over coupling	80,700 mm	65,000 mm
Vehicle width	2,720 mm	2,720 mm
Vehicle height	3,915 mm	3,915 mm
Bogie wheelbase	2,700 mm	2,700 mm
Driving wheel diameter, new	870 mm	870 mm
Carrying wheel diameter, new	760 mm	760 mm
Maximum output at wheel	2,600 kW at 25 kV/50 Hz (1,300 kW battery mode)	2,600 kW at 25 kV/50 Hz (1,300 kW battery mode)
Max. starting tractive effort	200 kN	200 kN
Max. starting acceleration	1,1 m/s ²	1,1 m/s ²
Maximum speed	75 mph	75 mph