ELECTRIC MULTIPLE UNIT

(SMU Series 220)

with 3-phase propulsion for Queensland Rail Suburban Services

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Walkers Limited, in joint venture with Adtranz Australia, has delivered 12, three car electric multiple units to Queensland Rail for operation in the Brisbane Suburban network. These vehicles will be supplemented by a further 30, three cars sets delivered during 1999 and 2000 and incorporating a most modern traction system and vehicle interior.

The cars are of stainless steel construction with glass reinforced plastic front ends. Three cars form a semi-permanently coupled set, consisting of two driving motor cars and a trailer car. Scharfenberg automatic multi-function couplers are fitted at the outer ends of the three car sets, so that six cars can be operated in peak hours.

The cars are fully airconditioned by means of one integral dual supply unit mounted in the centre roof section of each vehicle. All cars have two sets of high density composite material, power operated, bi-parting, sliding doors each side which are controlled by the driver. Individual pairs of doors only open at station stops if a passenger presses the 'door open' button.

Bodyside windows are dark tinted, double glazed sealed units, and the saloon interiors are finished in attractive vandal resistant glass reinforced plastic panels. Hard wearing carpet covers the saloon floor and vestibule and extends up the bodysides to the window sills.

The cars feature two-way communication between passengers and crew for increased passenger safety and include a voice annunciator system with GPS global positioning capability for station and special message announcements. All cars feature overt video surveillance cameras and recording equipment to aid law enforcement authorities in their investigations into any train incidents.

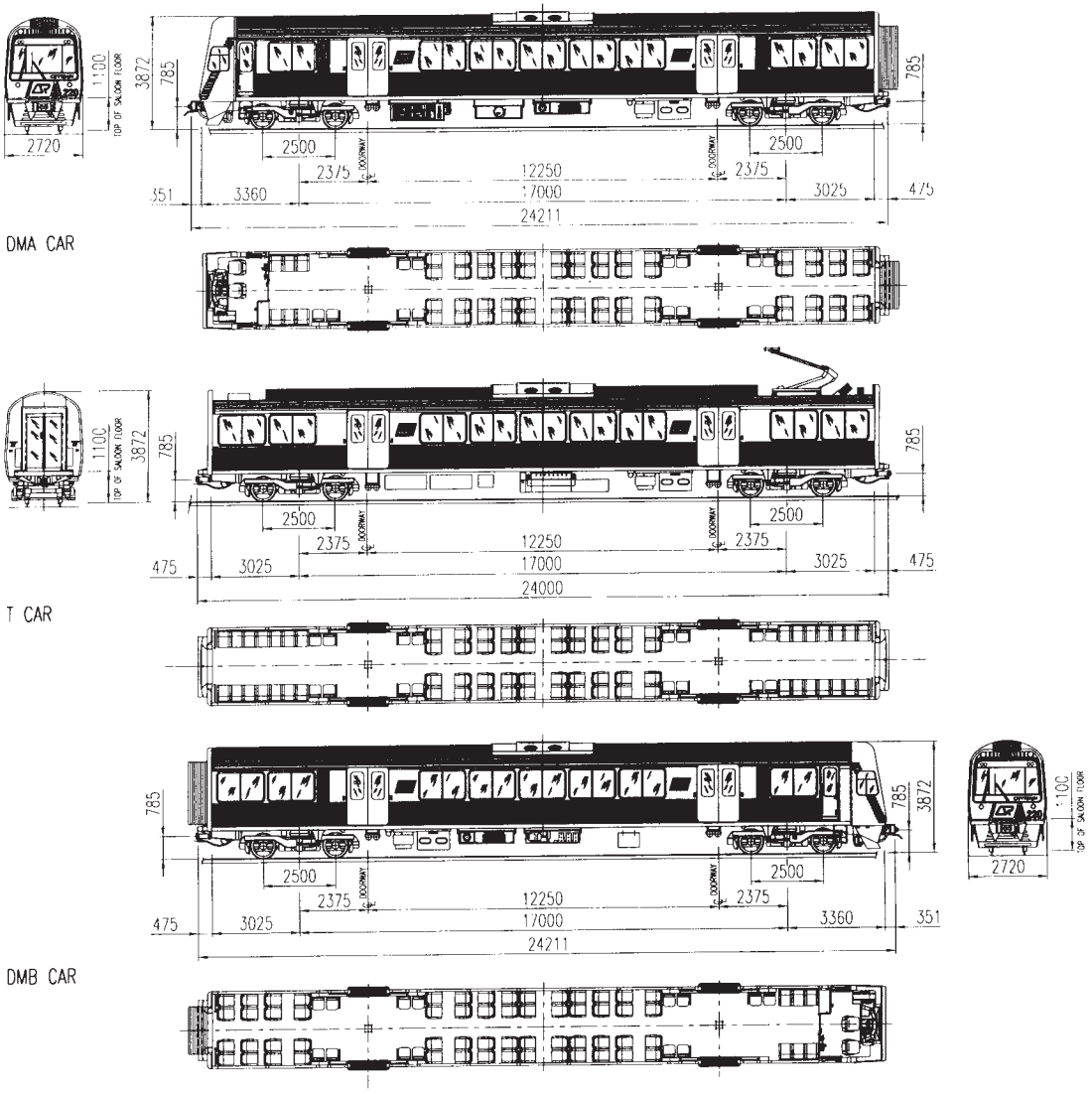
The main saloons have two-plus-two, fully cantilevered, fabric-covered, transverse seating. Two-passenger spring loaded flip up longitudinal seats are located each side of the doorways. Ceilings have two rows of longitudinal fluorescent lights and there are passenger-operated, power-assisted, bi-parting internal sliding doors at all non-driving ends of the cars.

A single arm pantograph operating on a 25kV overhead line, vacuum circuit breaker, oil-cooled transformer and two air cooled four-quadrant IGBT converters make up the power circuit. Each converter supplies four three-phase traction motors in one car. A special characteristic of the regenerative braking is that maximum torque is available from 75 km/h to near standstill.

The traction computer oversees the train functions and features a graphic display for the driver. Information is available to the driver as to the type of fault and reset or rectification procedure where possible. Fault storage is incorporated into the traction computer to enable maintenance staff to study the vehicle fault history.

The train braking system is microprocessor controlled and blends the pneumatic disc braking and electric regenerative brake systems. Wheel damping is provided to minimise wheel squeal. Two compressors provide increased train reliability in case of one compressor failure.

SMU DATA INFORMATION



Gauge	1067mm
Railway System Operator	Queensland Rail
Overhead line voltage	25kV 50Hz
Maximum speed	100 km/h
TARE WEIGHTS	
Driving motor car A	43t
Trailer car	40t
Driving motor car B	43t
Total mass of three-car set	126t
Traction Converter	Two IGBT air cooled 4 parallel traction motors
Traction motors (AC)	8 x 180 kW per three-car set
Gear ratio	1:5.673
Transmission	Bogie frame-mounted longitudinal motors with spiral bevel gear drive.
Brake system	Regenerative brake with blended EP tread brakes (motor cars) and axle mounted disc brakes (trailer car).
Acceleration rate	0.8m/sec^2
Deceleration rate	1.1m/sec^2

PASSENGER CAPACITY		
Driving motor car A	Seated	76
	Standing	86
	Total	162
Trailer car	Seated	84
	Standing	94
	Total	178
Driving motor car B	Seated	76
	Standing	86
	Total	162
Period of commissioning	1999 – 2001	