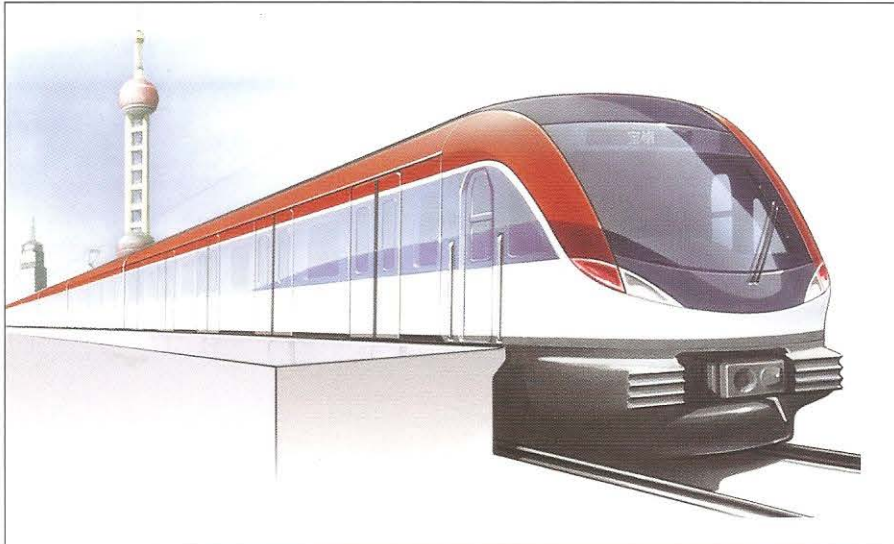


Shanghai – Metropolis® Metro ... ONIX 1500



Localisation

Localisation in China will play a major part in the success of the project with a significant portion of the work relating to the contract being carried out in China. The first joint venture is between ALSTOM and Shanghai Electric Corporation (SEC), this JV will specialise in IGBT based traction equipment manufacturing. Assembly of rolling stock will also be localised in line with contractual and other official requirements.

Force cooled inverter

The IGBT inverter is forced cooled to provide a light and compact equipment case for underfloor mounting. The equipment is based on the very successful 1500V IGBT system supplied to Korea for the Incheon contract and contains all the propulsion equipment except for the motors and brake resistor. No filtering is required for the cooling air so that the equipment requires little maintenance and provides a highly reliable system. The system is designed for ease of maintainability.

ONIX for Shanghai Metro

- 24 trains
- 144 cars
- 96 IGBT ONIX inverters
- ONIX 1500

Contract overview

Towards the end of 1998, ALSTOM signed a letter of intent with the Shanghai Mass Transit Pearl Line Development Company Ltd to supply 24 six-car train-sets for line 3 of the city's metro.

The new overhead line which will link the south-east to the north of the city is scheduled to enter service in the year 2000

Customer requirement

ALSTOM will supply its new Metropolis® metro product for line 3. Each train, which will meet the highest standards of passenger comfort, will be able to carry 336 passengers and run at speeds of 80 km/h.

The trains' lightweight aluminium cars will be equipped with ALSTOM's ONIX 1500 drive system based on IGBT technology.

The resulting reductions in equipment weight, size and power consumption will make the vehicles among the most advanced in the world.

Operational specification

Operator: Shanghai Line 3
 Line gauge: 1435 (standard)
 Line voltage range: 1000-1800Vdc
 Line length: 24.55 km
 Number of trainsets: 24
 Number of cars: 144
 Traction range: ONIX 1500
 Number of stations: 19

Type of vehicle: Metro
 Train consist:
 (Tc-Mp-M-M-Mp-Tc)
 Axle load: 16 t
 Power collection: Overhead
 Maximum tractive power:
 280 kW motor (1120kW per car)
 Maximum braking power: 450 kW
 per motor (1800 kW per car)

Maximum starting tractive effort:
 20.5 kN
 Maximum design speed:
 80 kph
 Maximum design acceleration:
 0.9 ms⁻²
 Maximum design braking rate:
 1.0 ms⁻²

PROPULSION

ONIX 1500 inverter and rheostatic chopper to provide regenerative and rheostatic braking.

CONTROL

AGATE 32 bit (CISC & DSP) microprocessors
 Equipment performance monitoring:
 Slip/slide control:

TRACTION DRIVE

4 x ONIX three phase AC motors

HIGH VOLTAGE

Line inductor
 Surge arrester:
 Hard crowbar:
 Circuit breakers:
 Contactors:
 Brake Resistor:

Technical characteristics

Nominal dc input:1500V
 Peak accelerating current, rms: 180 A rms per motor
 Cooling: Forced cooling
 Motor/inverter ratio: .. 4 motors per inverter
 Modulation frequency: Switching frequency up to 600 Hz

Auxiliary converter

Nominal dc input: 1500V
 Rating: 120 kVA
 Cooling: Forced cooling

ONIX AC motor

Supply voltage: 675/1169V
 Nominal power rating: 220 kW
 Rated speed: 2000 rpm
 Maximum speed: 4423 rpm at max speed with half worn wheels
 Cooling: Self ventilated
 Motors per axle: . One motor per axle

Dimensions and mass

Traction equipment case

Length: 2910 mm
 Width: 2100 mm
 Depth: 625 mm
 Mass: 1200 kg

Motor

Length: 630 mm
 Width: 500 mm nominal
 Depth: 500 mm nominal (560)mm max)
 Mass: 630 kg

Propulsion performance

