

METROPOLIS™

State-of-the-art metro

Drawing on more than a century of experience and an impressive track record in meeting customer expectations, Alstom is recognized worldwide as the provider of high-performance metro systems.

KEY FIGURES:

- $\frac{1}{4}$ metros in the world supplied by Alstom
- More than 4,000 metro cars sold
- More than 50 customers

MAJOR REFERENCES

- Amsterdam** (The Netherlands)
- Budapest** (Hungary)
- Buenos Aires** (Argentina)
- Caracas, Los Teques** (Venezuela)
- Chennai** (India)
- Istanbul** (Turkey)
- Lausanne** (Switzerland)
- Lima** (Peru)
- London** (UK)
- Madrid, Barcelona, Valencia** (Spain)
- Nanjing, Shanghai** (China)
- New York, Washington** (USA)
- Panama City** (Republic of Panama)
- Paris** (France)
- Rio de Janeiro, São Paulo** (Brazil)
- Riyadh** (Saudi Arabia)
- Santiago** (Chile)
- Santo Domingo** (Dominican Republic)
- Singapore** (Singapore)

Benefits

Metropolis meets three key requirements

- **Efficiency:** advanced technology optimises the performance of sub systems such as the traction bogie and braking systems, as well as door opening mechanism for instance
- **Flexibility:** the length and width of train sets, the number of cars and interior layouts are all modular to match all requirements
- **Reliability:** outstanding communication systems facilitate predictive maintenance and optimise safety

METROPOLIS BRINGS REAL ADDED VALUE TO THE MARKET

- Optimum passenger comfort and safety, reduced lifecycle and maintenance costs and simplified traffic management,
- Proven standardised components, higher reliability, easier access to equipment
- Higher capacity, combined with remarkable on-board comfort (on-board passenger information and communication system)
- A choice between automated driving mode and driver mode with optimised cabin ergonomics and visibility
- Customised design for each city, offering differentiation and personalisation

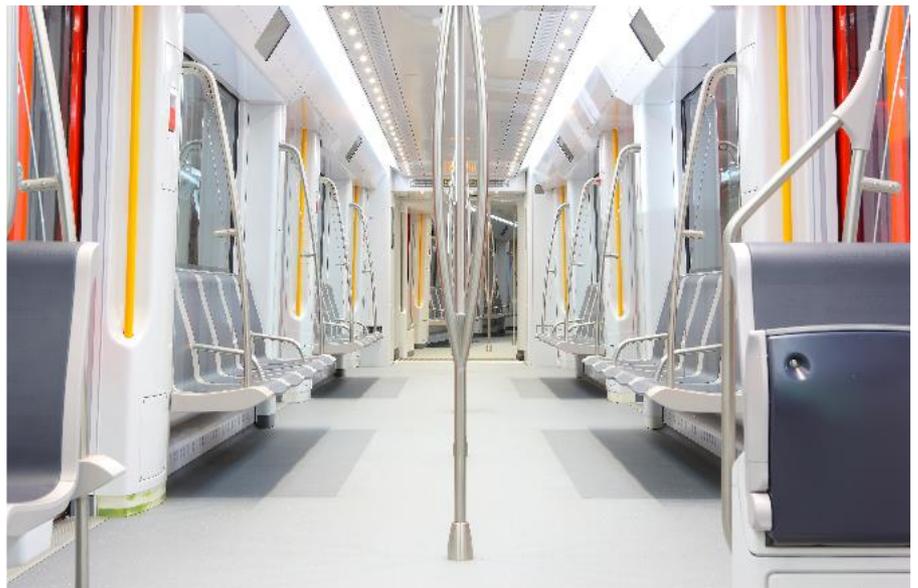
METROPOLIS SERVES AN EFFICIENT AND SUSTAINABLE MOBILITY

To limit energy consumption:

- Efficiency optimisation: HVAC regulation, LED, lighting management
- Weight reduction
- Motor control optimisation (acceleration, deceleration, coasting)

To guarantee maximum regeneration:

- Use of electrical braking to its maximum up to 0 km/h
- Use of regenerative sub-stations (HESOP)



KEY TECHNICAL FEATURES

Width	from 2.30 m to 3.2 m
Length	from 13 to 25 m
Several max. axle loads	Between 12 et 17 tons
Compression load	Up to 1500 kN
Maximum speed in service	Up to 90 km/h
Supply voltage	750Vdc, 1500Vdc, 3000Vdc, 25kVac
Carbody material	Stainless steel or aluminum
Wheel	Steel or rubber tire
Power supply	By catenary or 3rd rail
HVAC	Roof integrated HVAC

TRAINS CONFIGURATIONS

Motorization rates

2 cars train-set: 100% (2M)



3 cars train-set: 66% (2M-1T)



4 cars train-set: 50% (2M-2T) / 75% (3M-1T)



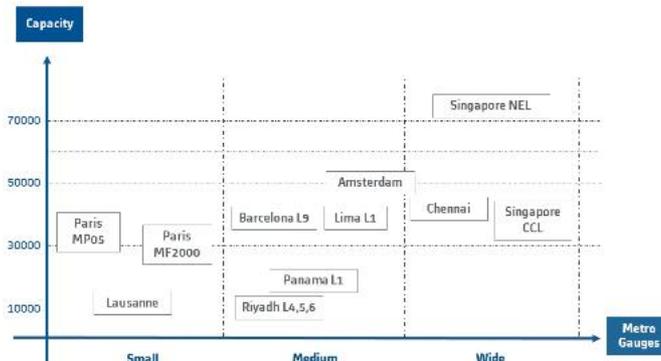
5 cars train-set: 60% (3M-2T) / 80% (4M-1T)



6 cars train-set: 66% (4M-2T) / 50% (3M-3T)



PASSENGER PER HOUR PER DIRECTION WITH 6p/m² AND 90s HEADWAY



TURNKEY SYSTEM APPROACH

Complete turnkey system capability, including metro train, signaling, track works, services,...

DRIVER CAB

- Independent driver cab air conditioning
- Ergonomic driver's desk and seat
- Enlarged side window

PASSENGER INFORMATION & SECURITY

- Line map display
- LCD display
- Text display
- Speaker
- Surveillance camera (CCTV)
- Intercom

MAINTENANCE

TrainTracer on-line tool to continuously monitor train's main components and bring information on each train condition in real-time to depot and OCC.

AUTOMATIC SYSTEM

Fully automatic, driverless (UTO*) system for any type of rolling stock: small, medium or large, steel wheel or rubber tire.

EXTERIOR & INTERIOR DESIGN MODULARITY

In-house Design & Style department to assist operators in determining the ideal exterior: bodysell shape and materials, gauge, car dimensions, livery.

Passenger flow optimized through: customizable doors, wide gangways, flexible seating configurations, dedicated space for persons with reduced mobility.

IN STANDARD OR CUSTOMIZABLE METRO CARS

Size	Shape	Length/Width	Wheels
Small		L: 13 – 18 m W: 2,3 – 2,7 m	Tire wheels or Steel Wheels
Medium		L: 18 – 21 m W: 2,7 – 2,9 m	Steel wheels
Wide		L: 21 – 25 m W: 2,9 – 3,2 m	Steel wheels

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