

CITADIS® X05

The latest evolution of Citadis

Alstom's Citadis is the low-floor tram reference for modern urban solutions and is at the core of multiple city renewal projects. The development of Citadis X05 is based on a 15 year proven track record of over 2,000 Citadis sold worldwide. Citadis was upgraded to deliver extra dimensions, capacity, flexibility, speed and passenger experience in order to allow higher frequency throughout the day and thereby increase the number of people an operator can carry on a network per year. Several world-wide customers already chose Citadis X05 trams.

HIGHLIGHTS

- More than 2,000 Citadis trams ordered for 50 cities worldwide
- 9 billion passengers; 4 million per day
- 1 billion km run by the Citadis tram fleet
- 1,600 Citadis trams in service
- 1 out of 4 low-floor trams in service worldwide manufactured by Alstom
- 20 million km run without catenary
- 98% of the mileage run worldwide without catenary operated / Citadis

GENERAL DESCRIPTION

Citadis X05 offers new choices on tram dimensions and configurations (in single-unit or double-unit operation), performance, comfort level and special features met by a system of service-proven modules that fit together. Innovations include: integration of new technologies for lower energy consumption (Permanent Magnet Motors) ; easier sub-system integration and maintenance which reduces LCC ; higher speed of up to 80 km/h; operable on existing and new tracks; catenary-free range (besides APS) now incorporating new full on-board autonomy systems - optimized and completely integrated. All these new technological advances offer cities of all sizes the highest performance tramway solutions - in order to meet the current and future evolving mobility challenges.

CUSTOMER BENEFITS**High degree of passenger comfort and convenience**

New levels of comfort include spacious design with double doors (15% passenger exchange ratio increase), 40% higher windows (in suspended modules), new ergonomic seat design option (Cityseat), real-time information on-board, direct & indirect lighting based on LED technology - all leading up to a more pleasurable urban commuter experience.

Lower OPEX

11% reduction of maintenance costs based on technical innovations including: optimized monitoring system through a Design to Serviceability process; Ethernet network for a quick download of monitoring data from a single access point for the upload of infotainment and passenger information system in manual or automatic wireless mode.

Advanced catenary-free offering

Alstom's solutions span most service-proven APS, and /or Citadis Ecopack, full on-board autonomy management system composed of latest generation super-capacitor and batteries. Key advantages of Alstom's catenary free solutions : preservation of the aesthetics of city centres; unlimited power supply; high performances (matching catenary performances), high availability (99.95% on 2-km double track applications); robustness and very limited impact on infrastructure.

Up to 25 % reduction in energy consumption thanks to latest design improvements :

- Proven ONIX 850 traction drive with closed self-ventilated Permanent Magnet Motors (PMM) highly efficient (96 %)
- Optimized HVAC function (air flow, passenger load...) and auxiliaries (auxiliary with variable frequency)

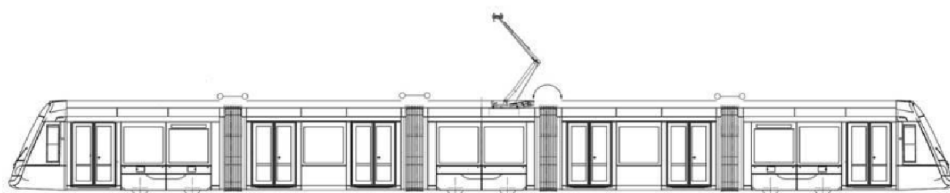


KEY TECHNICAL FEATURES

Specification criteria	Values specific to each nominal length		
	20 nominal meter versions CITADIS 205	30 nominal meter versions CITADIS 305	40 nominal meter versions CITADIS 405
Vehicle length depending on width of doors required	24 m	32 m to 37 m	43 m to 45 m
Vehicle width	2.4 m	2.4 m and 2.65 m	
Track gauge	1435 mm		
Number of bogies per tram	2	3	4
Number of car modules per tram	3	5	7
Provision for subsequent tram extension	Up to 5 modules (37 m)	up to 7 modules / 4 bogies	not extendable
Low floor percentage	100 %		
Access height (entrance)	intermediate doors: 326 mm, front doors: 342 mm (above top rail)		
Central aisle width over bogies	750 mm		
Number and type of doors per side (Sliding plug doors)	4 double doors	4 to 6 double doors or 2 to 4 double doors + 2 single doors	5 to 8 double doors or 3 to 6 double doors + 2 single doors
Seating configuration	modular arrangements (see diagram)		
Passenger capacity seated	41	42 to 66	57 to 82
(@ 4 pax /m ²) standing	101	152 to 184	215 to 237
TOTAL	142	202 to 238	271 to 341
comfort ratio ⁽¹⁾	29%	up to 28%	up to 25%
exchange ratio ⁽²⁾	26%	up to 27%	up to 25%
wheelchair areas	1	1 or 2	1 or 2
Passenger information equipment	different packages available		
HVAC (Heating, Ventilation, Air Conditioning)	independent controls for passenger & driver zones / scaled to relevant climatic conditions		
Motorization ratio	100%	67% (100% is an option)	75%
Maximum speed in service	70 km/h	80 km/h	
Maximum acceleration	1.3 m/s ²		
Service deceleration	1.2 m/s ²		
Compression load	400 kN		
Crash absorption resistance	meets EN15227 standards		
Minimum horizontal curve radius	20 m (in depot)		
Operation	bidirectional or unidirectional operation in single or double unit		
Traction motors	2 air-cooled permanent magnet motors per motorized bogie		
Power supply voltage	750 Vdc (600 Vdc as an option)		

(1) number of seats for passengers / total passenger capacity per tram

(2) sum of widths of doors / total length of passenger zone per tram



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