

Tramino

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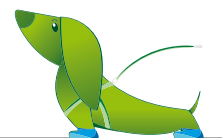
Power of Enthusiasm



Solaris Tramino low-floor trams

With increasing fuel prices and congested city streets, it is no surprise that more and more people choose public transport over private vehicles. An increasingly mobile society is a significant challenge for public transport companies as they must adapt their fleets to meet growing passenger needs. Solaris, one of the leading European manufacturers of low-floor city buses, meets those expectations.

The recipe for success and the experience gained from Urbino buses is now transferred by Solaris to a new market – rail vehicles. The Solaris Tramino combines best technical solutions, modern design, comfort and reliability. It is fully prepared to meet all the demands of both passengers and public transport companies.

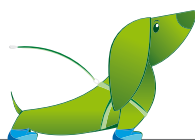


Development in Poland and in Germany

Solaris produces both multiarticulated and GTx trams. The Tramino Poznań is an example of the former type of vehicles, while Olsztyn, Jena and Braunschweig represent the latter. In these GTx trams, every body section runs on its own bogie. In 2012, Solaris delivered 22 Solaris Tramino to Poznań City Transport. It was the second part of the delivery of 45 vehicles ordered by the local operator. Poznań is not the only Polish city to have ordered Solaris trams. Olsztyn, the capital of the Warmian-Masurian Voivodeship, signed a contract for the delivery of 15 bi-directional, 29-metre long vehicles, to be completed by 2014. They will have six sets of double doors on each side, providing easy and comfortable access to the completely low floor throughout the tram. Fitted with 36 seats, these vehicles will be able to accommodate more than 230 passengers in total. In June 2011, Solaris signed its first foreign contract for the delivery of its trams. Five bi-directional, 29.3 metre long vehicles were delivered in the second half of 2013. They will be adapted for 1000 mm track gauge.

One year later, the German city of Braunschweig will receive 18 four-section, 35.7-metre trams. They will be the longest Tramino constructed so far. The local operator initially ordered 15 units and has already exercised an option to purchase an additional three vehicles.

But this is only the beginning of the Tramino's international travel. The trams' varied construction and parameters enable Solaris to adapt its offer to different customers' needs.

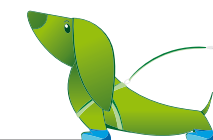




Integrated with the cityscape

Created by a team of experienced professionals, the Tramino Poznań is the first tram produced by Solaris. Taking into account the diverse needs of passengers, it offers the highest travel comfort. Classic wheelsets and no steps at the entrance and inside the vehicle provide a low floor along the entire length of the tram. This solution makes the tram fully accessible and comfortable for all passengers. The Tramino Poznań is 32 metres long and 2.4 metres wide. To facilitate rapid passenger flows even during peak hours, it is equipped with four extra-wide 1.500 mm double-leaf doors. The air-conditioned tram carries up to 229 passengers, 48 of them seated.

In 2012, the Solaris Tramino Poznań was honoured with the TOP Design Award, presented at Arena Design exhibition in Poznań. This prize, together with the high technical availability confirmed by Poznań City Transport (MPK), proves the tram's reliability and uniqueness. The Tramino Poznań has won the hearts of the city's inhabitants, becoming an integral part of Poznań's urban landscape.



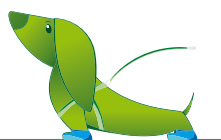


Tramino Jena begins a journey

According to specification, Jena were supplied with three-section, fully low-floor bidirectional trams. They are 29.3 metres long and 2.3 metres wide. In terms of construction, the vehicles differ significantly from the Tramino Poznań. These are the first GTx trams produced by Solaris. With their construction, the vehicles fit Jena's network perfectly, not only in terms of its infrastructure of tram tracks and depots, but also the existing tram fleet.

Jenaer Nahverkehr GmbH has ordered five Solaris Tramino. Each of them is equipped with an air-conditioning system for the driver's cab and passenger area. The vehicles can fit a total of 168 passengers, 61 of them seated. Every section is based on one centrally-mounted bogie. Consequently, the weight of every section is evenly distributed, the vehicle is more stable and the forces transmitted through the articulations are much smaller.

The Tramino Jena has four double doors per side, with a total width of 1300 mm each. One pair of them is located right behind the driver's cab, where there is also the wheelchair space. The Tramino Jena is the first tram operating in Germany which was supplied by a Polish manufacturer.





Reliable in all conditions

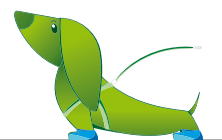
Tramino trams are manufactured in Solaris's own plants located in Środa Wielkopolska (bodyframes) and in Poznań (final assembly). Those factories are equipped with state-of-the-art machines and tools which optimise the manufacturing process and provide customers with products meeting highest requirements. This aim is achieved also with the help of many advanced and thoroughly tested design solutions. In the Solaris Tramino Poznań, for example, powered bogies have motors and gear assembly mounted on their outer side. This solution extends the operational lifetime of trams and enables them to run even on poor quality rails. The Tramino has been prepared for mounting supercapacitors which reduce its power consumption. The systems of air conditioning, traction, braking, lighting and door assemblies are connected via a bus system, which ensures efficient monitoring and diagnostics. All these solutions are designed to guarantee the reliability of Tramino trams in all conditions.





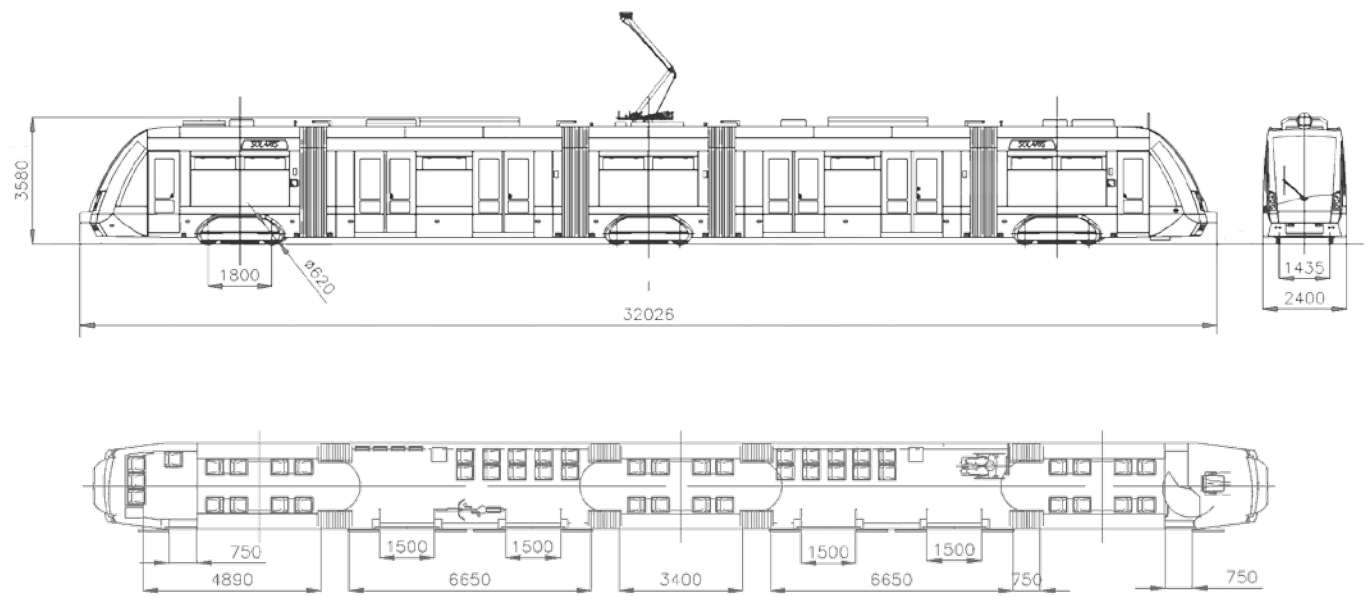
Tram with a rich interior

The interior is designed to ensure the functionality and security of the tram and comfortable travel of its passengers. The tram is lined with aesthetic, easy to maintain and durable plastic parts that meet all fire protection standards. Moreover, these elements have sound and thermal insulating properties, ensuring comfortable travel of passengers both in winter and summer conditions. The bottom part of the vehicle is additionally protected with thick, flexible protective layer that dampens noise. Designers particularly focused on obtaining an efficient air flow and air conditioning in the passenger compartment and driver's cab. This is ensured by automatically activated fans and heaters as well as hopper windows. The Tramino is also equipped with an ergonomic seat mounted in its air-conditioned driver's cabin. All devices for operating the tram are within the easy reach of the driver and devices for on-board information and control are very well visible. This provides the driver with a very comfortable workplace.



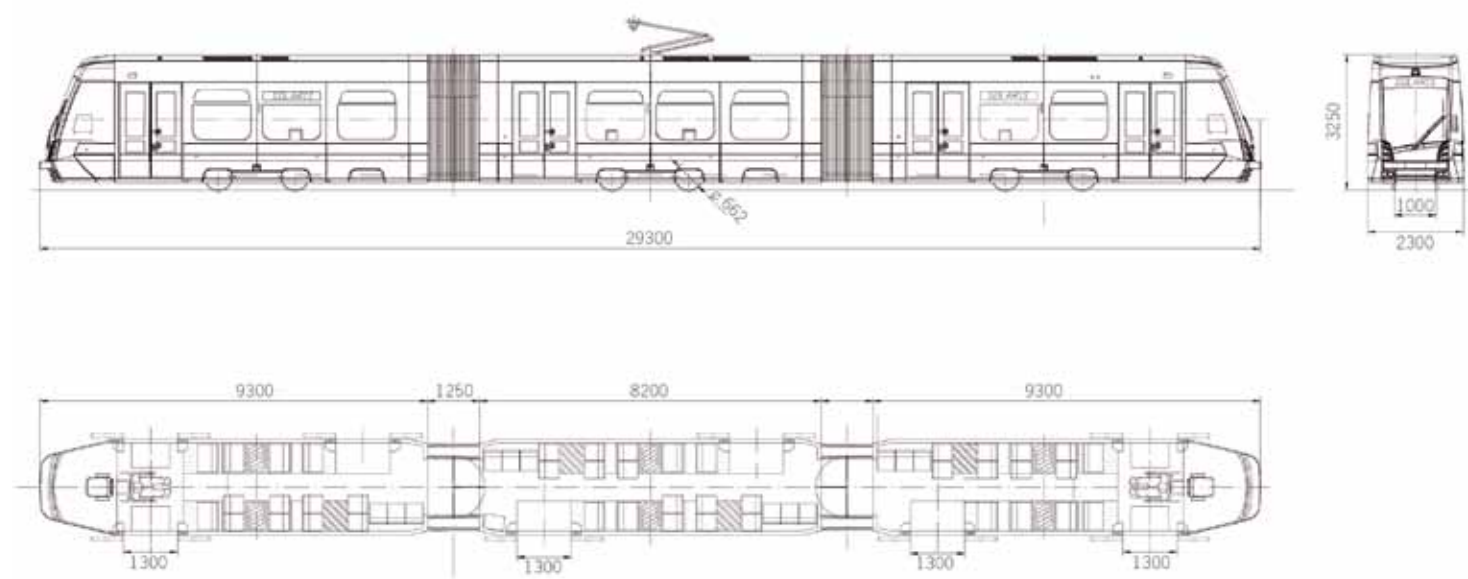


Tramino Poznań	
Total length of vehicle	32026 mm
Width of body shell	2400 mm
Internal width of body shell (maximum)	2195 mm
Height at retracted pantograph	3760 mm
Number of body sections	5
Number of bogies	
powered	2
non-powered	1
Track gauge	1435 mm
Wheel diameter (new/worn)	620 / 540 mm
Minimum curve radius	18 m
Floor height above top of rail	350 mm
Percentage of low-floor area	100 %
Number of seats (+ folding seats)	48 (+5)
Number of standees (5 passengers/m²)	181
Number of wheelchair spaces	2
Number of doors	
single-leaf doors (width 750 mm)	2
double-leaf doors (width 1500 mm)	4
Network voltage	600 V (+120 V, -200 V)
Number and power rating of traction motors	4x105 kW
Traction motors	asynchronous
Design maximum speed	80 km/h
Maximum speed	70 km/h
Air-conditioning	
driver's cabin	standard
passenger compartment	standard
Tram design life	30 years





Tramino Jena	
Total length of vehicle	29300 mm
Width of body shell	2300 mm
Internal width of body shell (maximum)	2090 mm
Height at retracted pantograph	3600 mm
Number of body sections	3
Number of bogies	
powered	1
with one drive axle	2
Track gauge	1000 mm
Wheel diameter (new/worn)	662 / 580 mm
Minimum curve radius	20 m
Floor height above top of rail	360 mm
Percentage of low-floor area	100 %
Number of seats	61
Number of standees (4 passengers/m²)	103
Number of wheelchair spaces	2
Number of doors	
double-leaf doors (width 1300 mm)	8
Network voltage	660 V (+165 V, -200 V)
Number and power rating of traction motors	4x90 kW
Traction motors	asynchronous
Design maximum speed	75 km/h
Maximum speed	70 km/h
Air-conditioning	
driver's cabin	standard
passenger compartment	standard
Tram design life	30 years



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