



## PRESS RELEASE

### Czechbus Prague 2018: Solaris displays two buses

Prague/Bolechowo, 20.11.2018

• At this year's Czechbus trade fair Solaris is showing two buses • Première of the Solaris Urbino 12 LE lite hybrid • Première of the new design of the Urbino and Trollino family – new generation post-facelift • Nearly 350 supplied and ordered electric buses • Experience derived from driving over 9 million electric kilometres • Over 2000 feasibility studies carried out for electric bus launches • Comprehensive offer regarding e-mobility: bus, charging system, prepping installation

During the 8th Central European Bus & Public Transport Fair Czechbus in Prague, Solaris will unveil two buses. First of those is the well-known Solaris Urbino 12 electric. The second of the presented vehicles is a complete product novelty of the Polish market leader. The Solaris Urbino 12 LE lite hybrid is a bus with low operating costs and lighter than the standard vehicle structure. Another novelty featured in Solaris' showpieces this year is that they all feature a whole new design.

#### Solaris Urbino 12 LE lite hybrid

The "low-calorie" name of the vehicle refers to its biggest advantage: low fuel consumption reducing the costs of exploitation in comparison to similar products available on the market. The main objective of the engineers of the Solaris Research and Development Office who developed the Urbino lite hybrid was to create a bus, which would consume less than 30 litres of fuel per 100 km in the SORT 2 test.

The engineering work was focused on multiple areas in order to accomplish the above, but one of the main factors was reduction of the vehicle's weight. The curb weight of the Solaris Urbino 12 LE lite hybrid is under 9 tonnes and its weight with passengers is 15 tonnes.

The heart of the drive system in the new Urbino model is the Cummins ISBE6 engine with volume of only 4.5 litres. The unit, which fulfils the restrictive EURO 6 exhaust emission standard, has 210 HP and torque of 850 Nm. The drive system of the Urbino LE lite hybrid is also equipped with an electrical machine with nominal power of 11.5 kW, which is tasked with recuperating energy during the braking process and supporting the combustion engine when the vehicle starts moving, which consequentially leads to it consuming less fuel.

The Solaris Urbino 12 LE lite hybrid will be available in version with two door in the 2-2-0 arrangement. The bus will be able to take up to 85 passengers, 41 of them seated. The front axle of the vehicle is provided by ZF RL55 and the drive axle is DANA type G150. The size of the wheels used in the vehicle differs from the standard solutions applied in Solaris city buses. This vehicle will be equipped with wheels of a smaller diameter: 19.5 inches. The wheelbase of the Solaris Urbino LE lite hybrid is 5900 mm with front overhang of 2550 mm and rear overhang of 3240 mm.

Despite having a "slimmed-down" build and several new components, the Solaris Urbino 12 LE lite hybrid, is uncompromising when it comes to the safety and comfort of both the passengers and the drivers, which is true for all Solaris products. The safety standards fulfilled by the vehicle include those specified in provisions R29 and R66.

“The new Solaris Urbino 12 LE lite hybrid is specifically for bus operators who see high value in low fuel emission with preservation of as much comfort as possible for passengers and drivers. Our clients receive the quality and durability guarantee to which the Solaris brand obliges,” said Zbigniew Palenica, Vice President of Solaris in charge of Sales, Marketing, After Sales, and the Department of Rail Vehicles.

### **Solaris Urbino 12 electric and e-mobility**

In barely eight years since the début of its first electric bus, Solaris has delivered or received orders for nearly 350 vehicles from customers in fourteen countries. At the Czechbus 2018 trade fair the Polish producer is showing zero-emission vehicles that draw from the experience of over 9 million kilometres driven by its buses. The latest technological solutions regarding heating, cooling and the steering system were designed to help reduce energy consumption. Solaris offers its customers comprehensive investment management services that cover not only the supply of buses and charging systems, but also ensure the prepping of installations including construction works.

### **New solutions**

Since introducing electric drivelines to its offer, Solaris has been constantly working on technologies to ensure an even better performance. Most of the effort devoted to the development of a heating system in electric buses is rooted in the desire to reduce energy use and to ensure the range extension of the vehicle. To that end producers often go for a diesel-fueled heater rather than other solutions; this one, though effective when temperatures are very low, is far from being emission-free. Solaris has proposed an innovative novelty in the form of a hybrid heating system fueled with LPG. It is a low-emission option, much cheaper than a standard diesel-fueled heater. What is more, LPG tanks are smaller than those applied for CNG, which means their installation is less complicated.

There is also a new option available to customers with regard to the heating and air-conditioning system where CO<sub>2</sub> is used as the working fluid, which is currently considered the most environment-friendly solution. The use of a heat pump allows to procure heat from auxiliary devices and thus limit the consumption of energy derived from batteries, which, in turn, results in extending the vehicle driving range and ensures efficient operation at low temperatures. All of these operations occur in zero-emission mode.

Another change the engineers at Solaris are already bracing for is the gradual limitation of the use of refrigerant R134a used in existing air-conditioning systems. Pursuant to EU decisions, by 2030 this substance is to be completely replaced by the much more eco-friendly R513a. Thanks to the efforts of the Polish producer and one of its suppliers, the air conditioning of vehicles made in Bolechowo can already be supplemented with the cleaner agent.

Modifications have also been applied to the power steering system. Of course, we speak of the electric power steering pump, powered with standard 24V batteries. For quite some time, this novel solution has been a staple in all electric and hybrid buses rolling out from the Bolechowo factory and an option for trolleybuses. This solution results in the reduction of energy consumption – since the pump does not burden the main engine – and, hence, it also increases the vehicle range. Another argument in favour of this design is the variable rotational pump speed thanks to which the power steering force is greater for lower speed levels and it is dropping as the speed keeps rising. Most importantly though, this solution entails a significant improvement of security, since the electric power steering pump is not dependent on other devices where a malfunction could lead to loss of control over the vehicle in extreme cases.

### **Remote diagnostics**

Another novelty is the remote diagnostic system for electric buses named eSConnect. It enhances and supports diagnostic and maintenance possibilities and also facilitates the analysis of specialist data derived from a vehicle. Buses equipped with a remote diagnostic system will allow the producer to establish a database of real performance data that can be later used to further perfect solutions applied by the manufacturer.

The eSConnect system may be installed both in every newly produced electric bus, as well as in those already delivered to customers. In fact, some of them have already decided to apply the pilot solution to their bus fleets. What is of importance to vehicle users, they can also use the data allowing them to optimize their bus fleet operation. Apart from serving maintenance purposes, the remote diagnostic system will also enable the manufacturer - a European leader in the production of electric vehicles -

to further refine its vehicle designs which have already garnered the firm the title of “Bus of the Year 2017.”

Remotely collected data include among others information on the time and location status of the bus fleet, the updated battery status, the mileage covered by any given vehicle in a time frame defined by the user or the energy use. The eSConnect system allows also for the remote identification of potential defects signaled by the vehicle on the driver's panel, the monitoring of operating parameters of the system and the generation of statistic data such as the number of charging cycles and the time needed to recharge batteries.

The remote diagnostic system proposed by Solaris entails quite a few advantages for its customers. For the buyers of vehicles from Bolechowo the system means a better use of the vehicle fleet and ensuring the correct operation of buses by drivers. What is more, the eSConnect gives customers the possibility to collect and analyse data that simplify the precise identification of technical requirements for buses serving on particular routes.

### **Prepare for electromobility**

To most municipalities and carriers electric drives represent a novel solution. At the request of an interested customer, and in order to help them prepare for the electrification of bus lines, Solaris can draft an individual feasibility study. The Office of Research and Development (BBiR) of the Polish manufacturer is devising the optimal solution in terms of e-mobility, based on customer requirements and a range of input data, such as the temperature range in a given city, needed to estimate energy consumption not only in normal conditions but also in extreme situations, the average speed, the topography of the area the bus line is serving, the number of stops, the passenger streams, the timetables and many other.

The outcome of the feasibility study will be a report listing recommendations of the best technical solutions with regard to electric buses. The study takes into consideration such factors as the place of operation of the electric bus and the carrier's requirements. In practice, this means the document will name among others the size and type of batteries, the recommended charging infrastructure, predicted energy use and the battery service life. By sharing best practices and its know-how, Solaris supports municipal transport operators in their efforts to develop electromobility.

### **The Solaris Urbino 12 electric on display**

The drive unit of the Solaris Urbino 12 electric presented at the Czechbus trade fair consists of two electric engines with a peak performance of 125 kW (110 kW net performance each), installed at the drive axle. The energy needed to propel those is stored in Solaris High Energy batteries with a total capacity of 240 kWh. The vehicle version presented at the trade fair may be charged using a stationary external charger or a (34kW) onboard charger without the need to install additional infrastructure. The presented bus contains 28 passenger seats of which 12 are accessible from the low floor.

It is the Solaris Urbino 12 electric bus that was awarded the title city bus of the year in the “Bus of the Year 2017” contest.

Solaris has delivered nearly 200 buses with an electric drive so far. Another 150 are being assembled. The electric Urbinos have covered a distance of over 9 million kilometers for customers from 14 countries. See the most popular electric bus in Europe at trade fair stand no. PK11 in the right wing of the Industrial Palace!

### **Additional information**

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#### **About our company**

Solaris Bus & Coach sp. z o.o. is a leading producer of city and intercity buses in Europe. It focuses on the development of low-emission and zero-emission vehicles, i. e. electric and hydrogen buses as well as trolleybuses. Over 25,000 Solaris vehicles have been delivered so far and they ply the streets in 850 towns and cities across 33 countries located throughout Europe as well as beyond it. Solaris is part of the Spanish CAF Group (Construcciones y Auxiliar de Ferrocarriles) S.A. From conception, to the design and manufacturing phases, all Solaris buses are produced in Poland. All activities undertaken by the company are in line with its mission, which is reflected in the brand's promise: to change the image

of public transport. Solaris also actively partners with public transport operators and provides them with comprehensive support in their transition to zero-emission mobility. Solaris products have been repeatedly awarded for quality and innovation. The Urbino 18 hydrogen bus has won the prestigious 'Bus of the Year 2025' title.