

CITY ON WHEELS



Few brands have made the Czech Republic as famous around the world as Škoda from the city of Pilsen. Škoda Group is an important company continuing the tradition of production of a trolleybus range, now called ŠKODA T'CITY, and is currently building on its experience and focusing its efforts on the production of battery-powered ŠKODA E'CITY and hydrogen-powered ŠKODA H'CITY buses, while at the same time expanding its portfolio to include diesel-powered ŠKODA D'CITY and CNG-powered ŠKODA G'CITY buses for urban and suburban transport. The company pays a great deal of attention to the use of cutting-edge technologies for modern public transport and railway vehicles. It invests on average 5% of its annual turnover in the development of new products. The company employs around 800 people, including more than 200 specialists in the field of technical development, projects and design. Škoda is a stable, strong and experienced European company that guarantees quality, reliability and long-term cooperation. Its activities build on the tradition of the Škoda plants in Pilsen stretching back more than one hundred and sixty years.

Škoda Group is one of the leading European companies in the field of transport engineering. The group focuses on the production and development of vehicles for rail and public transport. Its products mainly include suburban train units, electric locomotives, low-floor trams, metro trains, trolleybuses and electric trolleybuses for environmentally friendly public transport.

Škoda currently employs over 6 500 people. In addition to the Czech Republic production sites and technology centres, Škoda Group has branches in Germany, Finland, Hungary and Poland. Škoda Group is part of PPF Group, which invests in a number of sectors from financial services through telecommunications and biotechnology to real estate and engineering. PPF Group operates in Europe, Asia and North America.



ŠKODA



TRIDRO

A LONG TRADITION OF TROLLEYBUS PRODUCTION

Škoda has engaged in development and manufacturing of trolleybuses since the 1930s, when technology improved enough to allow trolleybuses to be deployed in urban traffic. Thanks to the skills and knowledge of the engineers at Škoda, it did not take long for the vehicle with its two characteristic trolley poles on the roof to prove that it had made itself indispensable in the public transport system and became a popular means of transport for many decades.

In view of the increasing demands for a high level of passenger comfort in public transport, a healthy environment and the extension of individual transport routes, so-called partial trolleybuses are appearing, equipped with an auxiliary drive which allows them to also move around away from the overhead lines for several kilometres. The first partial trolleybuses were equipped with diesel generators or supercapacitors.

A new trend is to equip the trolleybus with traction batteries, thanks to which all the parameters of a completely environmentally friendly and emission-free vehicle are maintained. One of the main reasons is that these are emission-free vehicles which are suitable for all parts of the city with traction lines.

Throughout their long and successful history, Škoda trolleybuses have found application in hundreds of cities on three continents and in 2014, Škoda produced its jubilee 14,000th trolleybus as part of a record delivery of 125 modern trolleybuses to the Latvian capital Riga. Other major international projects include deliveries to Bratislava, Budapest, Sofia, Žilina and Bologna. There is also considerable interest in modernisation of previously delivered Škoda trolleybuses, e.g. in the American city of Boston.



ŠKODA T'CITY

Public transport operators are looking for the very best electric vehicles to modernise their public transport fleets. ŠKODA T'CITY trolleybuses offer unrivalled advantages over any other vehicle in their class.

Experience with trolleybuses used in public transport dates back to 1936, when the first trolleybus left the gates of the Škoda factory and took to the streets of Prague. Škoda has been known as a pioneer in the world of trolleybuses for more than eight decades now.

ŠKODA T'CITY family is consistently and responsibly designed for maximum transport capacity, offering comfortable seating and standing space along the entire length of the vehicle. Spacious standing areas at all doors ensure that passengers can enter and exit the vehicle quickly. This means that operators do not lose time at trolleybus stops.

The large windows also provide passengers panoramic views of the city as they travel quietly and comfortably through urban and suburban areas. Large windows allow more natural light to penetrate, which helps reduce the need for artificial lighting and therefore saves energy.

	Length mm	Width mm	Height mm	Number of seats depending on type
	12 000	2 550	3 450	25–35
	18 000	2 550	3 450	35–50
	24 000	2 550	3 450	40–65

ŠKODA T'CITY 12 m

Škoda Group from Pilsen offers a standard twelve-metre fully low-floor trolleybus in its portfolio. This trolleybus can be three-door or four-door and can be operated on lines with a voltage of 600 or 750 V DC. All of the electrical equipment is stored in one compact container on the roof of the vehicle. Passenger comfort is enhanced by the vehicle's full low-floor design, wide aisles between the seats, a clear information system and a fold-out platform for wheelchair users. In addition to this, the vehicle is equipped with regenerative braking and a kneeling function, which makes it easier to enter and exit the vehicle. This type of trolleybus has gained great popularity among customers and has become greatly sought-after both on the domestic and foreign market.

SMART SOLUTIONS

In addition to this, the trolleybus can be equipped with traction batteries, which are located at the rear of the vehicle and allow fully-fledged operation away from the overhead lines. Trip comfort in the trolleybus is improved by a powerful heating system, air-conditioning in the driver's cab or the entire passenger compartment, a camera system or semi-automatic pantographs.

REFERENCES

Short trolleybuses by Škoda have been successfully put into operation in hundreds of cities on three continents. The largest deliveries include 100 trolleybuses to four major cities in Bulgaria, contracts in Slovakia (e.g. for the cities of Bratislava, Žilina, Prešov and Banská Bystrica) or battery-powered projects for the Czech Republic (Ostrava, Pilsen and Zlín) and abroad (Galati, Plevni, Burgas, Varna, Sofia and Timisoara).

BASIC TECHNICAL PARAMETERS

Length	12 020 mm
Width	2 550 mm
Height	3 420 mm
Maximum speed	65 km/h
Number of passengers	up to 85 (depending on vehicle equipment)



ŠKODA T'CITY 18 m

This is an 18-metre articulated trolleybus, which is designed for public transport and allows transportation of a larger number of passengers. The articulated trolleybus can have four or five doors for comfortable entry and exit of passengers and can be operated on lines with 600 or 750 V DC. The Škoda electrical equipment is stored in a container on the roof of the vehicle, called the roof unit. Passenger comfort is enhanced by the vehicle's full low-floor design and wide aisles between comfortable seats. The energy demands and maintenance costs are significantly reduced by the asynchronous Škoda traction motor and a microprocessor-controlled voltage inverter with the option of recuperation. There is also a fold-out platform for wheelchair users and a modern information system.

OTHER TROLLEYBUS EQUIPMENT

The articulated trolleybus can be equipped with an auxiliary battery drive which allows it to operate even away from the traction lines. Subject to customer request, the trolleybus can for example be equipped with equipment for counting passengers, air-conditioning for the driver and passengers, powerful heating or even an alcohol tester.

REFERENCES

Articulated trolleybuses by Škoda have found success not only in Czech cities (Chomutov, Teplice, Hradec Králové and Brno) but also abroad (Sofia, Riga, Bologna and Cluj). More than 100 trolleybuses have been delivered to Slovakia and new battery-powered trolleybuses are in operation both in Czech cities (České Budějovice, Ostrava, Pilsen, Zlín and Ústí nad Labem) and abroad (Brasov, Bergen, Szeged, Budapest and Limoges, etc.).

BASIC TECHNICAL PARAMETERS

Length	18 000-18 750 mm
Width	2 550 mm
Height	3 450 mm
Maximum speed	65 km/h
Number of passengers	up to 160 (depending on vehicle equipment)





DYNAMIC DEVELOPMENT FOR CITIES OF THE 21st CENTURY

Production of battery-powered buses belongs at the very highest level of technological development. Škoda is both following established solutions and at the same time setting the trends, for example, with its own charging technology. The electromobility portfolio currently consists of four types of city E-buses, with something for even the most discerning of customers. A 12m electric bus with innovative two-pole charging, an E-bus with standard typical night charging with the option of fast charging and an electric bus with ultra-high performance continuous charging. A 9m E-bus with standard charging is also available.

Battery-powered buses have the advantage of very quiet, emission-free operation, which is appreciated by passengers and city




dwellers alike. Another major advantage in urban traffic is the possibility of recuperation – dynamic braking, where the kinetic energy of the vehicle is stored back in the batteries.

With the falling price of batteries, electric buses are gradually gaining importance and their share in the fleets of transport companies is rising sharply. Škoda is one of the companies which are successfully developing their projects in the field of electromobility in the Czech Republic and abroad. Škoda has experience with battery-powered vehicles in Třinec, České Budějovice, Hradec Králové, Zlín, Pilsen, Trutnov, or for example the Slovak cities of Žilina and Nové Zámky.

ŠKODA E'CITY

ŠKODA E'CITY electric buses offer you a different way to look at the world. Clean and quiet operation shows citizens and passengers a whole new perspective on the possibilities offered by public transport. Operators can create routes which were never possible before, for example, stops in the interior of shopping centres, airports or railway stations. Reduction of noise in already busy areas, in residential zones or near schools and hospitals contributes towards a better-quality environment in urban areas. Operation of electric buses offers new opportunities to make public transport more attractive.

On board ŠKODA E'CITY, passengers can enjoy the ride from the efficiently arranged comfortable seats in a bright and spacious environment, talk to others, listen to music or just enjoy the electric bus ride. All routes are different. Be this in terms of distance, need for transport capacity, climate or topography in the place of operation. As a result of this, Škoda offers maximum flexibility in charging options, where charging capacity, charging method, time and power are the basic parameters. Modular energy storage configuration allows for continuous recharging during operation or operation without the need for recharging. Vehicle charging can therefore be adapted to suit the existing or emerging electric bus charging and recharging systems. Charging can then be scheduled at any time within the determined timetable – during operation, during breaks at final stops or at night in the depot. Monitoring of operating status allows for optimisation of daily charging and vehicle maintenance.

	Length mm	Width mm	Height mm	Number of seats depending on type
	9 496	2 400	3 226	18–26
	12 020	2 550	3 300	25–35
	18 000	2 550	3 300	35–50

ŠKODA E'CITY 9 m

ŠKODA E'CITY 9 m is designed to suit all needs with the option of overnight slow charging or fast charging via a pantograph. Flexibility aims to offer the widest possible range of options with consideration given to the choice of battery size, meaning that the vehicle can precisely match the customer's specific autonomy requirements without having to carry additional weight, reducing passenger capacity.

The electric bus includes aesthetic and comfort features for both passengers and drivers. With different levels of interior and exterior customisation, alternatives are available ensuring a comfortable and convenient journey while at the same time meeting the demands of the operating conditions.

The flat floor along the entire length of the vehicle allows for optimised speed of passenger boarding and alighting, and better access for people with reduced mobility for passengers with a pram or wheelchair users. Thanks to its features, ŠKODA E'CITY perfectly meets the changing demands presented by urban mobility.

BASIC TECHNICAL PARAMETERS

Length	9 496 mm
Width	2 400 mm
Height	3 226 mm
Maximum speed	70 km/h
Number of passengers	up to 65
Power	100 kW
Plug-in	✓



ŠKODA E'CITY 12 m

ŠKODA E'CITY is a two-axle, three-door, purely low-floor battery-powered M3 category electric bus designed for urban public passenger transport. The electric bus complies with ECE regulations or their equivalent EEC/EC directives applicable to this type of vehicle and also complies with the general regulations for motor vehicles approved for use on roads.

The internal layout of space and seats meets the requirements for public transport with frequent stops. In the area of the second door, there is space for two prams or two wheelchairs or one pram and one wheelchair. These areas are equipped with equipment for fixing and securing wheelchairs. The vehicle is based on the concept of low-floor modular construction. It has a 100% low floor to standing area ratio and there are no steps in the passageway inside the electric bus. A boarding height of 340 mm at the front, middle and rear doors allows passengers to enter and exit both from ground level and from bus stop islands. To facilitate passenger boarding and alighting, the vehicle is equipped with a tilting system during which the boarding edge of the door is lowered. The pneumatic chassis system also allows for a function where the body height of the bus is raised.

The driver's cab offers a wide view. The steering, together with the ergonomically positioned controls, allow comfortable operation of the vehicle. The vehicle's electrical equipment, including the traction battery, meets all of the criteria for protection against electric shocks in accordance with ECE 100. The vehicle is equipped with an automatic vehicle insulation monitoring system. The 24 V DC circuits are galvanically isolated from the mains supply. The configuration of the electrical equipment allows the recovered energy to be used to recharge the traction batteries or for the vehicle's own consumption. Charging of the electric bus batteries is ensured by a two-pole spring-loaded semi-pantographic collector located on the roof of the vehicle. Charging is possible at special charging stations supplied with voltage from the overhead trolleybus network 600/750 V DC.

An electrical equipment diagnostic system allows you to record, retrieve and analyse all of the information and operating data from the electrical equipment, the air-conditioning unit and charging peripherals.


BASIC TECHNICAL PARAMETERS

Length	12 020 mm
Width	2 550 mm
Height	3 300 mm
Maximum speed	80 km/h
Number of passengers	up to 85 (according to technical specifications)
Output	160 kW
Plug-in	✓
Fast charging	✓
Oportunitní charging	✓



ŠKODA H'CITY

Urban bus transport is a very promising sector for zero-emission vehicles, a sector where hydrogen technology could be developed. ŠKODA H'CITY is a hydrogen bus which supplements the mosaic of ŠKODA CITY portfolio. As part of ŠKODA New Energy Vehicles solution, ŠKODA H'CITY is ideally equipped for today's cities of tomorrow. It uses PEM fuel cells and batteries as its power source.

	Length mm	Width mm	Height mm	Number of seats depending on type
	12 020	2 550	3 430	26–30

ŠKODA H'CITY

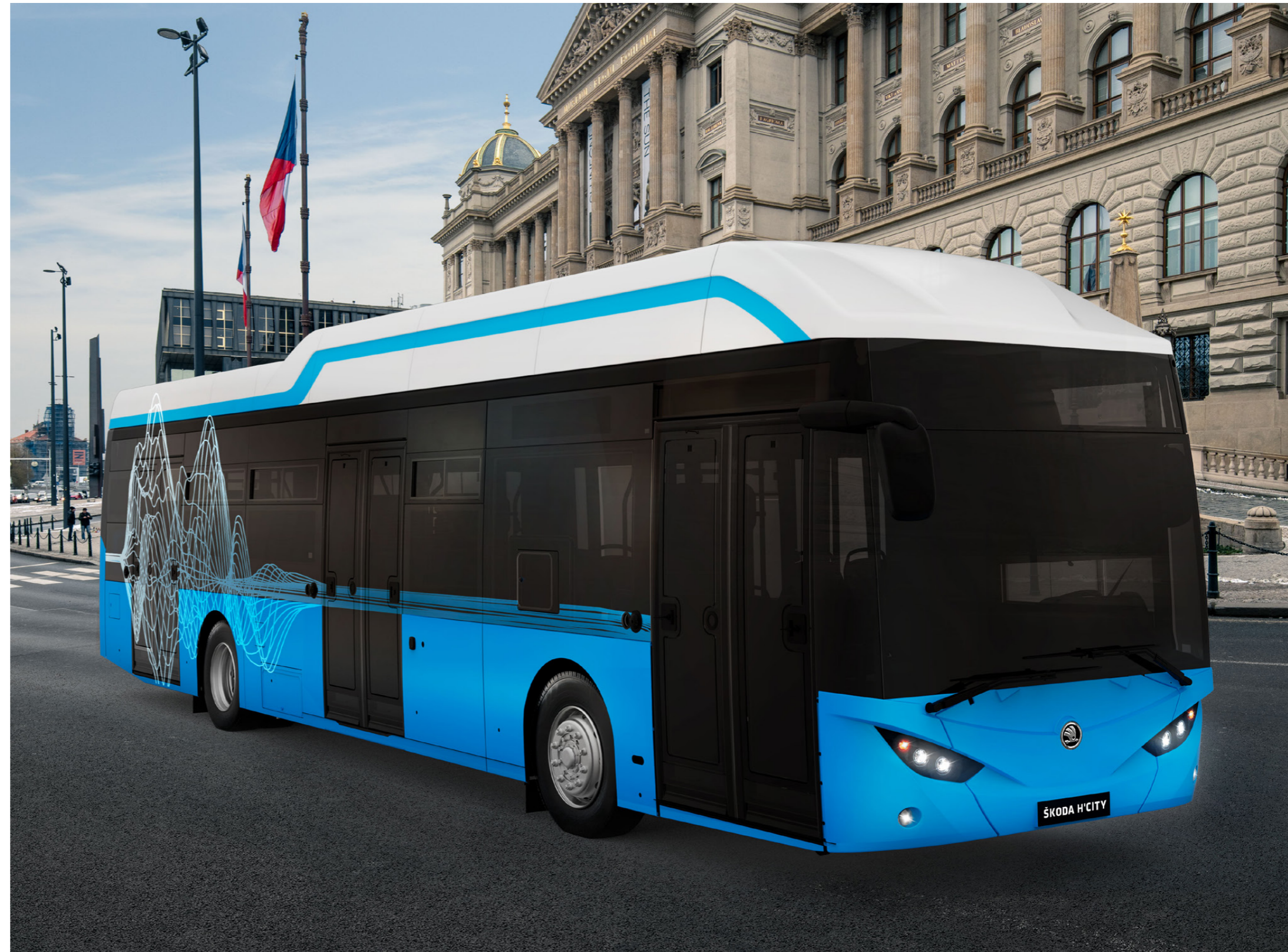
A range of up to 350 kilometres, extremely low noise and vibration, a comfortable interior and fast refuelling all contribute towards provision of unparalleled comfort for passengers and drivers alike.

The modular body design allows hydrogen buses to be configured in a variety of ways optimising the universality of the specifications.

ŠKODA H'CITY reinforces our commitment to developing environmentally friendly transport solutions and complements ŠKODA CITY portfolio of eco-friendly buses. Electric buses powered by batteries or fuel cells are becoming the mainstays of emission-free sustainable mobility.

BASIC TECHNICAL PARAMETERS


Length	12 020 mm
Width	2 550 mm
Height	3 430 mm
Maximum speed	80 km/h
Number of passengers	up to 85
Wheelchairs	2
Range	up to 350 km
Hydrogen storage capacity	39 kg



ŠKODA G'CITY

ŠKODA G'CITY buses powered by Compressed Natural Gas (CNG) significantly reduce emissions. ŠKODA G'CITY buses are a balanced mix of impressive looks, reliable and useful solutions, safety and environmentally friendly operation.

ŠKODA G'CITY is a specially designed low-floor public transport vehicle which offers an efficient solution to the urban traffic demands of today.

	Length mm	Width mm	Height mm	Number of seats depending on type
	12 020	2 550	3 330	26–30

ŠKODA G'CITY

ŠKODA G'CITY buses are cost efficient in operation, meet high safety standards and offer high reliability. G'CITY combines environmentally-friendly fuel with quiet operation.

ŠKODA G'CITY buses offer a high degree of comfort for passengers and the driver and enable a pleasant, modern driving experience. They are a future-oriented alternative to vehicles with conventional drives.

BASIC TECHNICAL PARAMETERS

Length	12 020 mm
Width	2 550 mm
Height	3 330 mm (incl. A/C and gas tanks)
Maximum speed	80 km/h
Number of passengers	up to 95



IBUSSES

ŠKODA BUSES WITH CONVENTIONAL DRIVE



Diesel buses are now the mainstay of the public urban, suburban and long-distance transport system. The Škoda portfolio now includes diesel buses covering all types of public transport. The bus drive technology is precisely adapted to the specific vehicle design. Buses are powered by engines which meet the strictest emission standards, are equipped with an automatic gearbox and safety systems of the very highest level – ABS, ASR, EBS and ESP to protect operation of the bus in demanding

conditions. An advanced emergency braking system (AEBS) offers automatic braking capability in the event of any danger. A lane departure warning system (LDWS) warns the driver with an audio signal and vibration if the bus is drifting out of its lane. The impressive design, lightweight construction, corrosion protection, modern equipment, reliability and high value for money make this an attractive offer for each and every customer.

ŠKODA D'CITY

ŠKODA D'CITY low-floor city buses cover all of the requirements of public bus companies.

The distinctive design, ergonomically balanced layout ensuring a high level of driving comfort for drivers and passengers, maximum safety, outstanding quality and convincing cost-effectiveness make ŠKODA D'CITY a vehicle that meets all the requirements of public urban transport in the context of multimodal travel.

	Length mm	Width mm	Height mm	Number of seats depending on type
	9 536	2 400	3 132	25–30
	12 020	2 550	3 200	27–35

ŠKODA D'CITY 9 m

ŠKODA D'CITY low-floor city buses cover all the requirements of public bus companies. The distinctive design, ergonomically balanced layout ensuring a high level of driving comfort for drivers and passengers, maximum safety, outstanding quality and convincing cost-effectiveness make the ŠKODA D'CITY a vehicle that meets all the requirements of public urban transport in the context of multimodal travel

BASIC TECHNICAL PARAMETERS

Length	9 536 mm
Width	2 400 mm
Height	3 132 mm
Maximum speed	100 km/h
Number of passengers	up to 65
Weight	14 400 kg
Engine	Cummins ISBE Euro6 250
Transmission	Automatic 6+1 T280R
Fuel tank	200 l
Doors	1-2-0 or 1-2-1



AFTER-SALES SERVICES

Škoda also offers additional services throughout the whole of the product lifetime. These are provided by a partner which, as a designer and manufacturer, can provide them at the very highest level, using the latest know-how, with the economy of an established manufacturer and, of course, in compliance with all of the required standards and regulations.

FULL SERVIS

General maintenance of the vehicle fleet, including regular maintenance and unscheduled repairs. The customer is completely relieved of daily operational worries. No more dealing with human resources, missing spare parts or unreliable suppliers.

And above all - maintenance is performed directly by the manufacturer, i.e. by the most technologically qualified entity on the market, which has many years of experience with this model, in several countries and with different models and product types.

SPARE PARTS

The manufacturer is always a reliable guarantee of supply of original spare parts. Škoda Electric also provides sophisticated options for delivery of spare parts, where, for example, the customer can benefit from the convenience of storing parts directly on their premises. They are then literally "at hand". This mainly concerns consignment warehouses or "stock replenishment".

REPAIR AND MAINTENANCE

The customer can perform routine maintenance itself, but still has the option of contacting the manufacturer in the event of more complex operations or unexpected events. They can then be sure that the first major repair work, for example, will be performed in a competent and thorough manner, but also taking into account the economic aspect of the issue.

SUPPORT SERVICES

Škoda Electric uses the latest technologies and innovations during development and production. This gives Škoda a great technological background, which it is happy to share with customers via technical support. Customised training, material analysis and measurement, provision of electronic diagnostics and on-line monitoring rank among the main services which customers use.



Škoda Group
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